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National Occupational Analysis

2010 | Carpenter

Human Resources and Skills Development Canada
Ressources humaines et Développement des compétences Canada
Canada

Occupational Analyses Series

Carpenter

2010

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FOREWORD

The Canadian Council of Directors of Apprenticeship (CCDA) recognizes this National Occupational Analysis as the national standard for the occupation of Carpenter.

Background

The first National Conference on Apprenticeship in Trades and Industries, held in Ottawa in 1952, recommended that the federal government be requested to cooperate with provincial and territorial apprenticeship committees and officials in preparing analyses of a number of skilled occupations. To this end, Human Resources and Skills Development Canada (HRSDC) sponsors a program, under the guidance of the CCDA, to develop a series of National Occupational Analyses (NOA).

The NOAs have the following objectives:

- to describe and group the tasks performed by skilled workers;
- to identify which tasks are performed in every province and territory;
- to develop instruments for use in the preparation of Interprovincial Red Seal Examinations and curricula for training leading to the certification of skilled workers;
- to facilitate the mobility of apprentices and skilled workers in Canada; and,
- to supply employers, employees, associations, industries, training institutions and governments with analyses of occupations.

ACKNOWLEDGEMENTS

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LIST OF PUBLISHED NATIONAL OCCUPATIONAL ANALYSES (Red Seal Trades)

TITLE	NOC* Code
Agricultural Equipment Technician (2007)	7312
Appliance Service Technician (2005)	7332
Automotive Painter (2009)	7322
Automotive Service Technician (2009)	7321
Baker (2006)	6252
Boilermaker (2008)	7262
Bricklayer (2007)	7281
Cabinetmaker (2007)	7272
Carpenter (2010)	7271
Concrete Finisher (2006)	7282
Construction Electrician (2008)	7241
Construction Craft Worker (2009)	7611
Cook (2008)	6242
Electrical Rewind Mechanic (1999)	7333
Electronics Technician – Consumer Products (1997)	2242
Floorcovering Installer (2005)	7295
Glazier (2008)	7292
Hairstylist (2009)	6271
Heavy Duty Equipment Technician (2009)	7312
Industrial Electrician (2008)	7242
Industrial Mechanic (Millwright) (2009)	7311
Instrumentation and Control Technician (2007)	2243
Insulator (Heat and Frost) (2007)	7293
Ironworker (Generalist) (2006)	7264
Ironworker (Reinforcing) (2006)	7264
Ironworker (Structural/Ornamental) (2006)	7264
Lather (Interior Systems Mechanic) (2007)	7284

* National Occupational Classification

TITLE	NOC* Code
Machinist (2005)	7231
Metal Fabricator (Fitter) (2008)	7263
Mobile Crane Operator (2009)	7371
Motorcycle Mechanic (2006)	7334
Motor Vehicle Body Repairer (Metal and Paint) (2010)	7322
Oil Heat Systems Technician (2006)	7331
Painter and Decorator (2007)	7294
Partsperson (2005)	1472
Plumber (2008)	7251
Powerline Technician (2009)	7244
Recreation Vehicle Service Technician (2006)	7383
Refrigeration and Air Conditioning Mechanic (2009)	7313
Rig Technician (2008)	8232
Roofer (2006)	7291
Sheet Metal Worker (2006)	7261
Sprinkler System Installer (2009)	7252
Steamfitter — Pipefitter (2008)	7252
Tilesetter (2004)	7283
Tool and Die Maker (2005)	7232
Transport Trailer Technician (2008)	7321
Truck and Transport Mechanic (2007)	7321
Welder (2009)	7265

Requests for these National Occupational Analyses may be forwarded to:

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Human Resources and Skills Development Canada
140 Promenade du Portage, Phase IV, 5th Floor
Gatineau, Quebec K1A 0J9

These publications are also available to order or download online at: www.red-seal.ca. Links to Essential Skills Profiles for some of these trades are available on this website.

STRUCTURE OF ANALYSIS

To facilitate understanding of the occupation, the work performed by tradespersons is divided into the following categories:

Blocks	the largest division within the analysis that is comprised of a distinct set of trade activities
Tasks	distinct actions that describe the activities within a block
Sub-Tasks	distinct actions that describe the activities within a task
Key Competencies	activities that a person should be able to do in order to be called 'competent' in the trade

The analysis also provides the following information:

Context	information to clarify the intent and meaning of tasks
Trends	changes identified that impact or will impact the trade including work practices, technological advances, and new materials and equipment
Tools and Equipment	categories of tools and equipment used to perform all tasks in the block; these tools and equipment are listed in Appendix A
Related Components	a list of products, items, materials and other elements relevant to the block
Required Knowledge	the elements of knowledge that an individual must acquire to adequately perform a task

The appendices located at the end of the analysis are described as follows:

Appendix A — Tools and Equipment	a non-exhaustive list of tools and equipment used in this trade
Appendix B — Glossary	definitions or explanations of selected technical terms used in the analysis
Appendix C — Acronyms	a list of acronyms used in the analysis with their full name
Appendix D — Block and Task Weighting	the block and task percentages submitted by each jurisdiction, and the national averages of these percentages; these national averages determine the number of questions for each block and task in the Interprovincial exam
Appendix E — Pie Chart	a graph which depicts the national percentages of exam questions assigned to blocks
Appendix F — Task Profile Chart	a chart which outlines graphically the blocks, tasks and sub-tasks of this analysis

DEVELOPMENT AND VALIDATION OF ANALYSIS

Development of Analysis

A draft analysis is developed by a committee of industry experts in the field led by a team of facilitators from HRSDC. This draft analysis breaks down all the tasks performed in the occupation and describes the knowledge and abilities required for a tradesperson to demonstrate competence in the trade.

Draft Review

The NOA development team then forwards a copy of the analysis and its translation to provincial and territorial authorities for a review of its content and structure. Their recommendations are assessed and incorporated into the analysis.

Validation and Weighting

The analysis is sent to all provinces and territories for validation and weighting. Participating jurisdictions consult with industry to validate and weight the document, examining the blocks, tasks and sub-tasks of the analysis as follows:

BLOCKS	Each jurisdiction assigns a percentage of questions to each block for an examination that would cover the entire trade.
TASKS	Each jurisdiction assigns a percentage of exam questions to each task within a block.
SUB-TASKS	Each jurisdiction indicates, with a YES or NO, whether or not each sub-task is performed by skilled workers within the occupation in its jurisdiction.

The results of this exercise are submitted to the NOA development team who then analyzes the data and incorporates it into the document. The NOA provides the individual jurisdictional validation results as well as the national averages of all responses. The national averages for block and task weighting guide the Interprovincial Red Seal Examination plan for the trade.

This method for the validation of the NOA also identifies common core sub-tasks across Canada for the occupation. If at least 70% of the responding jurisdictions perform a sub-task, it shall be considered common core. Interprovincial Red Seal Examinations are based on the common core sub-tasks identified through this validation process.

Definitions for Validation and Weighting

YES	sub-task performed by qualified workers in the occupation in a specific jurisdiction
NO	sub-task not performed by qualified workers in the occupation in a specific jurisdiction
NV	analysis Not Validated by a province/territory
ND	trade Not Designated in a province/territory
NOT COMMON CORE (NCC)	sub-task, task or block performed by less than 70% of responding jurisdictions; these will not be tested by the Interprovincial Red Seal Examination for the trade
National Average %	average percentage of questions assigned to each block and task in Interprovincial Red Seal Examination for the trade

Provincial/Territorial Abbreviations

NL	Newfoundland and Labrador
NS	Nova Scotia
PE	Prince Edward Island
NB	New Brunswick
QC	Quebec
ON	Ontario
MB	Manitoba
SK	Saskatchewan
AB	Alberta
BC	British Columbia
NT	Northwest Territories
YT	Yukon Territory
NU	Nunavut

ANALYSIS

SAFETY

Safe working procedures and conditions, accident prevention, and the preservation of health are of primary importance to industry in Canada. These responsibilities are shared and require the joint efforts of government, employers and employees. It is imperative that all parties become aware of circumstances that may lead to injury or harm. Safe learning experiences and work environments can be created by controlling the variables and behaviours that may contribute to accidents or injury.

It is generally recognized that safety-conscious attitudes and work practices contribute to a healthy, safe and accident-free work environment.

It is imperative to apply and be familiar with the Occupational Health and Safety (OH&S) Acts and Regulations, and Workplace Hazardous Materials Information System (WHMIS) Regulations. As well, it is essential to determine workplace hazards and take measures to protect oneself, co-workers, the public and the environment.

Safety education is an integral part of training in all jurisdictions. As safety is an imperative part of all trades, it is assumed and therefore it is not included as a qualifier of any activities. However, the technical safety tasks and sub-tasks specific to the trade are included in this analysis.

SCOPE OF THE CARPENTER TRADE

"Carpenter" is this trade's official Red Seal occupational title approved by the CCDA. This analysis covers tasks performed by carpenters whose occupational title has been identified by some provinces and territories of Canada under the following names:

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
Carpenter	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓
General Carpenter						✓							
Carpenter - Joiner					✓								

Carpenters construct, renovate and repair residential, institutional, commercial and industrial (I.C.I.) structures made of wood, steel, concrete and other materials.

They can work for a wide array of employers, including new home builders and renovation firms, construction firms, building owners and users, building developers and government departments. Many carpenters are union members and a significant number are self-employed.

While the scope of the carpenter trade includes many aspects of building construction, a growing number of carpenters work for contractors who specialize in such areas of trade practice as concrete forming, framing, finishing, interior systems and renovation. Carpenters are employed in a variety of job environments, including houses under construction or renovation, plants that pre-fabricate buildings and commercial and industrial sites. They may work in a variety of weather conditions. Many carpenters routinely work overtime in peak periods or according to the needs of each project.

Safety is of prime importance to all carpenters. There is some risk of injury resulting from slips and falls, falling objects and the use of hand and power tools. The proper use of personal protective equipment is very important to carpenters regardless of their location of work. Risk assessments prior to performing tasks are very important.

Some important competencies of a carpenter are good knowledge of mathematics, the ability to use metric and imperial measurements, an understanding of building science, communication and problem solving skills and the ability to work independently or as part of a team. Other skills present in a competent carpenter are the ability to work at heights, the ability to stand or kneel for long periods of time, manual dexterity and good balance. Carpentry is a physically demanding occupation requiring the lifting of heavy tools and materials. As carpentry is primarily a work-based training trade, mentoring of apprentices and workers is a necessary skill for journeyperson carpenters.

This analysis recognizes similarities and overlaps with the work of other tradespersons such as roofers, lathers (interior systems mechanic), floorcovering installers, concrete finishers, ironworker (reinforcing) and cabinetmakers. Experienced carpenters may advance to foreman and construction superintendent or may become contractors. Carpenters are involved in every step of building construction, which is an advantage when applying for supervisory positions.

OCCUPATIONAL OBSERVATIONS

There is an increase in the use of specialized power tools that are taking the place of some hand tools. Such tools as detail sanders, layout instruments (total station) and laser levels are making the carpenters' work more accurate and efficient. Cordless tools are now commonplace and are improving in longevity, durability and torque. Compressed gas-powered fastening tools are increasing in use due to their portability and efficiency. Scissor lifts, rolling platforms and zoom booms are replacing scaffolding and ladders on many job sites.

Some concrete forming systems are now made of plastics, composites and aluminium, making concrete forming more versatile and efficient. New engineered forming systems such as insulated concrete forms (ICFs) are emerging in the industry.

There are a number of "green building" certification systems becoming commonplace in the governmental and private construction industry. Use of these environmentally friendly systems can influence the selection of building materials and products and can include building techniques aimed at achieving increased energy-efficiency.

Many companies in the construction industry are providing leadership in safety awareness and in the enforcement of safety policies on the job site. Safety training and the development of safety policies and procedures are being done by many companies in excess of regulations.

The mentoring of entry level workers is becoming more pronounced in the worksite and at apprenticeship technical training.

BLOCK A COMMON OCCUPATIONAL SKILLS

Context This block includes work practices and procedures that carpenters perform throughout their trade.

Trends Compressed gas-powered fastening tools are increasing in use due to their portability and efficiency. Scissor lifts, rolling platforms and zoom booms are replacing scaffolding and ladders on many job sites.

Tools and Equipment See Appendix A.

Task 1 Uses tools and equipment.

Related Components All components apply.

Required Knowledge

K 1	knowledge of manufacturers' specifications
K 2	knowledge of boring tools
K 3	knowledge of hand cutting tools
K 4	knowledge of abrading and planing tools
K 5	knowledge of assembly and dismantling tools
K 6	knowledge of measuring tools
K 7	knowledge of squaring and marking tools
K 8	knowledge of clamping tools
K 9	knowledge of RPM ratings for blades and discs and the importance of matching this rating to power tool RPM
K 10	knowledge of types of portable power tools such as electric, pneumatic, battery-powered and gas-powered
K 11	knowledge of types of stationary power tools such as table saws, planers and jointers
K 12	knowledge of types of powder-actuated tools and shots
K 13	knowledge of safe operating procedures for powder-actuated tools

K 14	knowledge of licensing and training requirements for the use of powder-actuated tools, chainsaws and power elevated work platforms
K 15	knowledge of types of fasteners
K 16	knowledge of safety precautions, hazards and risks
K 17	knowledge of types of rigging and hoisting equipment
K 18	knowledge of components of rigging and hoisting equipment
K 19	knowledge of hand signals for rigging and hoisting
K 20	knowledge of regulations and requirements for the operation of material handling and access equipment such as zoom booms, skid steers and fork lifts
K 21	knowledge of rigging and hoisting practices such as load weight calculations, working load limits and sling angles
K 22	knowledge of knots and hitches
K 23	knowledge of types of layout instruments such as total station, transits, laser levels and builder's levels
K 24	knowledge of basic survey theory and terminology
K 25	knowledge of tack welding
K 26	knowledge of welding practices
K 27	knowledge of training requirements for tack welding equipment
K 28	knowledge of torch cutting techniques and practices
K 29	knowledge of types of PPE and safety equipment such as hard hats, fall protection, eye protection, respiratory protection and hearing protection
K 30	knowledge of PPE and safety equipment operations
K 31	knowledge of training requirements for PPE and safety equipment

---

Sub-task

A-1.01 Uses hand tools.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-1.01.01	select and use hand tools according to task
A-1.01.02	organize and store hand tools to assist in inventory of tools and to prevent damage
A-1.01.03	lubricate hand tools such as wrenches, chisels and block planes to prevent rusting and corrosion

A-1.01.04	sharpen hand tools such as planes, drill bits and chisels
A-1.01.05	recognize worn, damaged and defective hand tools, tag and remove from service if necessary

---

Sub-task

A-1.02 Uses portable power tools.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-1.02.01	select and use portable power tools according to task
A-1.02.02	recognize hazards and risks of use of power tools
A-1.02.03	charge batteries according to manufacturers' specifications to avoid damage to battery
A-1.02.04	lubricate power tools such as chain saws, and concrete chipper and drills
A-1.02.05	recognize worn, damaged and defective power tools, tag and remove from service if necessary
A-1.02.06	clean power tools for ease of operation and longevity
A-1.02.07	organize and store power tools in a clean, dry environment
A-1.02.08	sharpen tools such as drill bits and chain saws

Sub-task

A-1.03 Uses stationary power tools.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-1.03.01	select and use stationary power tools according to task
A-1.03.02	recognize hazards and risks of use of stationary tools
A-1.03.03	remove and replace knives for planers and jointers
A-1.03.04	adjust stationary power tools such as jointers, planers and table saws
A-1.03.05	maintain guards such as anti-kickback devices and belt guards to prevent injury
A-1.03.06	adjust belt tension and alignment for motors to prevent wear of belt and to ensure proper RPM

A-1.03.07	clean tools to ensure smooth operation and to eliminate fire hazards
A-1.03.08	recognize damaged and worn components such as knives and blades, tag and remove from service if necessary

---

Sub-task

A-1.04 Uses powder-actuated tools.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-1.04.01	inspect tool prior to use to detect obvious faults and defects
A-1.04.02	warn co-workers prior to operating tools
A-1.04.03	select shots and fasteners according to application and materials being fastened
A-1.04.04	select and use powder-actuated tools according to task
A-1.04.05	recognize hazards and risks of use such as flying debris, ricochet of fasteners, kickback and excessive noise
A-1.04.06	dismantle, lubricate, clean and re-assemble powder-actuated tools according to manufacturers' instructions
A-1.04.07	store tools, pins and shots in a secure, clean and dry location
A-1.04.08	dispose of spent, misfired and unspent shots to prevent potential risk

---

Sub-task

A-1.05 Uses pneumatic tools and equipment.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-1.05.01	select and use pneumatic tools and equipment according to task
A-1.05.02	recognize hazards of use such as deflecting fasteners, jamming guns and unintended discharge
A-1.05.03	select fasteners according to length, material being fastened and application
A-1.05.04	inspect tools, hoses, and safety connections (whip checks) to prevent damage to tools and injury to workers

A-1.05.05	adjust air regulator for specific pneumatic tool being used
A-1.05.06	change mineral oil and filter according to manufacturers' specifications
A-1.05.07	drain compressor tank after use to prevent corrosion of tank and damage to tools
A-1.05.08	lubricate tools and equipment according to manufacturers' specifications
A-1.05.09	store tools and equipment in a secure location

Sub-task

A-1.06 Uses rigging and hoisting equipment.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-1.06.01	select and tie knots according to load and application
A-1.06.02	select rigging equipment according to load and application
A-1.06.03	set up load using dunnage to enable access for lifting chains and slings, and for storage
A-1.06.04	secure load using rigging methods such as choking, slinging and securing hooks
A-1.06.05	locate lifting points to ensure proper sling angle and to balance and secure the load
A-1.06.06	calculate load weight for working load limit
A-1.06.07	use tag lines, following safe operating procedures, to guide and control the load
A-1.06.08	follow daily procedures such as use of a test block, inspection of rigging equipment and storage

Sub-task

A-1.07 Uses layout instruments.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-1.07.01	select layout instruments according to task
A-1.07.02	select location of setup to avoid high traffic areas and to ensure efficiency and accuracy of layout
A-1.07.03	transport, set up, secure, level and adjust instruments to ensure accuracy of layout and good access for operator
A-1.07.04	assemble and use survey rod to ensure accurate measurements
A-1.07.05	recognize the need for calibration of layout equipment
A-1.07.06	check for accuracy of levels by using back sighting and fore sighting
A-1.07.07	determine elevations and angles
A-1.07.08	record layout information such as elevations, grid lines and offsets
A-1.07.09	clean and dry instruments
A-1.07.10	store instruments in a clean, dry and secure location after each use
A-1.07.11	set out building points using a transit or a laser level

---

Sub-task

A-1.08 Uses tack welding equipment. (NOT COMMON CORE)

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	no	no	no	NV	yes	yes	no	no	no	NV	NV	NV

Key Competencies

A-1.08.01	identify unsafe conditions such as frayed cables, and damaged ground clamp and stingers
A-1.08.02	perform daily checks on equipment to maintain fuel and oil levels
A-1.08.03	select and use tack welding equipment for basic tasks such as securing load-bearing steel studs
A-1.08.04	store equipment and rods in a clean and dry location

Sub-task

A-1.09 Uses torch cutting equipment. (NOT COMMON CORE)

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	no	no	no	NV	yes	yes	yes	no	yes	NV	NV	NV

Key Competencies

A-1.09.01	inspect hoses, gauges, compressed gas cylinders and connections for leaks and damage
A-1.09.02	clean tips with tip cleaner to ensure even flow of gas
A-1.09.03	set gauges to required pressures for efficient cutting
A-1.09.04	follow procedures and sequences for lighting and operation
A-1.09.05	select and use torch cutting equipment for tasks such as cutting rebar and cutting holes in metal
A-1.09.06	store equipment securely such as compressed gas cylinders and hoses
A-1.09.07	maintain striker by replacing the flint

Sub-task

A-1.10 Uses personal protective equipment (PPE) and safety equipment.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-1.10.01	identify damage to PPE such as respiratory equipment, hard hats, face shields and fall protection equipment in order to remove from service
A-1.10.02	select fall protection equipment appropriate for work conditions, regulations and company policies
A-1.10.03	select and use eye and ear protection according to task and company policies
A-1.10.04	select and use respiratory equipment according to task and company policies
A-1.10.05	adjust PPE such as respiratory equipment, hard hats and fall protection equipment to ensure proper fit
A-1.10.06	wear approved safety boots according to task, weather conditions and company policies
A-1.10.07	locate safety equipment such as first aid station, fire extinguisher and evacuation boxes
A-1.10.08	use fall protection equipment following guidelines such as proper lanyard length and anchoring points

A-1.10.09	use site-specific safety equipment such as air horns and fire extinguishers according to manufacturer's instructions, site instructions and company policy
A-1.10.10	store PPE such as respiratory equipment and fall protection equipment in a clean dry location

Task 2 — Uses building materials.

Related Components (including, but not limited to)

Materials: wood, concrete, metal, masonry, composite, plastic, glass, ceramic, engineered wood, fibreglass, polystyrene, gypsum.

Fasteners: screws, nails, bolts, staples, embeds, anchors, shear plates, rivets, adhesives, joist hangers, timber frame connectors, post-beam connectors, gang plates.

Membranes: rubber, asphalt, bitumen, polyethylene, air/weather barriers and vapour barriers, concrete sealant, chemical sealant.

Others: foundation coatings, drainage systems, frost protection, insect protection, grouts (non-shrink, hydraulic), tarps, grouting additives, damp-proofing and water proofing, chemical sealing, spray-on rubber adhesives.

Insulation: loose fill, batt, fibreglass, reflective, flexible, rigid, protective, expanding foam, acoustical.

Required Knowledge

K 1	knowledge of wood defects
K 2	knowledge of wood properties such as composition, moisture content, sizing, strength and grain
K 3	knowledge of building codes
K 4	knowledge of material applications
K 5	knowledge of handling and storage procedures
K 6	knowledge of climatization and acclimatization requirements of materials
K 7	knowledge of WHMIS and MSDS
K 8	knowledge of types of fasteners, adhesives and connectors
K 9	knowledge of structural materials such as wood, concrete, metals and masonry
K 10	knowledge of non-structural materials such as insulation, plastic and gypsum

K 11	knowledge of types of protective membranes such as air/weather barriers, vapour barriers, waterproofing barriers and damp-proofing barriers
K 12	knowledge of types of sealants such as acoustic, silicone and expanding foam
K 13	knowledge of types of fire stop materials
K 14	knowledge of air and vapour related problems
K 15	knowledge of moisture-related problems
K 16	knowledge of building science principles (air, moisture and vapour flow)
K 17	knowledge of types of foundation protection
K 18	knowledge of soil conditions and backfill procedures
K 19	knowledge of drainage principles
K 20	knowledge of insect and pest damage prevention
K 21	knowledge of parging
K 22	knowledge of types of insulating materials
K 23	knowledge of energy considerations such as the R-2000 technical standard and insulation levels prescribed by building codes
K 24	knowledge of regulations and requirements for the operation of material handling and access equipment such as zoom booms, skid steers and fork lifts
K 25	knowledge of concrete design requirements

Sub-task

A-2.01 Selects materials.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-2.01.01	select wood products according to grade, species and defects
A-2.01.02	select size of materials according to construction drawings, task and building code
A-2.01.03	identify construction materials according to construction drawings and specifications
A-2.01.04	consider efficiency factors such as size of material, availability and ease of use

Sub-task

A-2.02 Handles materials.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-2.02.01	organize delivery and quantities of materials to increase efficiency and productivity
A-2.02.02	store and band materials on site to ensure product quality
A-2.02.03	store flammable materials in a secure location
A-2.02.04	handle hazardous materials using PPE and according to WHMIS
A-2.02.05	store hazardous materials in approved containers to avoid spills and damage to environment
A-2.02.06	protect materials from extreme weather conditions using materials and equipment such as tarps and heaters
A-2.02.07	operate material handling equipment such as zoom booms, skid steers and fork lifts unless prohibited without required special certification
A-2.02.08	lift and carry materials using safe lifting techniques
A-2.02.09	plan material lifts to avoid excessive point loading on roofs and floors

Sub-task

A-2.03 Installs fasteners, adhesives and connectors.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-2.03.01	select fasteners for applications such as roofing, exterior sheathing and framing
A-2.03.02	select fastener size according to applications, codes and specifications
A-2.03.03	locate position for and attach fasteners such as shingle nails and screws according to application, manufacturer's specifications, codes and construction drawings
A-2.03.04	select adhesives according to materials, manufacturers' specifications, and codes

A-2.03.05	apply adhesives such as subfloor adhesive, wood glue and epoxies according to climate conditions such as extreme cold and heat, and moisture
A-2.03.06	locate position for and attach connectors such as joist hangers, seismic and tie-down anchors, and sill plate bolts

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Sub-task

A-2.04 Installs membranes and sealants.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-2.04.01	select and place sill plate gaskets to seal the joint between building materials such as concrete or wood
A-2.04.02	select and apply sealants such as fire stop caulking, silicones, architectural/structural caulking and expanding foam insulation
A-2.04.03	apply bituminous membrane to structures such as foundations, walls, window and door openings and roofs to prevent penetration of moisture
A-2.04.04	select and apply exterior air/weather barriers according to manufacturers' application procedures
A-2.04.05	select and apply interior vapour barrier with tools such as staplers, caulking gun and tape according to code
A-2.04.06	apply vapour barrier strips during framing at top wall plates, joists and interior walls to ensure continuous VDR (vapour diffusion retarder) according to code
A-2.04.07	seal vapour barrier to penetrations such as electrical boxes, vents and windows and doors using acoustical sealant
A-2.04.08	apply eave protection to roofs according to the building code

Sub-task

A-2.05 Installs foundation protection.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-2.05.01	select foundation protection materials according to construction drawings and manufacturers' specification and code
A-2.05.02	install weeping tile and aggregate to allow for proper drainage
A-2.05.03	seal tie holes and joints in concrete foundations using materials such as caulking, liquid foundation damp-proofing and grout
A-2.05.04	apply bituminous caulking to joints, nail holes and knots in preserved wood foundations according to code
A-2.05.05	install drainage plane membrane protection
A-2.05.06	apply liquid foundation damp-proofing to concrete and preserved wood foundations from footing to grade level using tools and equipment such as brush, roller and sprayer to prevent penetration of moisture
A-2.05.07	apply solid membrane foundation damp-proofing and water proofing such as peel-and-stick or dimple wrap to ICFs to prevent penetration of moisture

Sub-task

A-2.06 Installs insulating materials.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-2.06.01	select insulation materials according to specifications and location
A-2.06.02	fasten rigid insulation materials to roofs, foundations, under slabs and exterior walls using fasteners such as nails and adhesives
A-2.06.03	install ceiling insulation and baffles to allow for proper air ventilation from soffits to roof vents
A-2.06.04	install wall insulation such as batt or loose to ensure all cavities are filled

A-2.06.05	install insulation such as fibreglass, spray foam and backer rod around exterior doors and windows to ensure thermal insulation and reduced air leakage
A-2.06.06	install sound board and acoustic panels

Task 3 Interprets documentation.

Related Components (including, but not limited to)

National Building Code and referenced standards, blueprints, specifications, health and safety regulations, WHMIS documentation, site instructions, change orders, building permits, inspection reports, provincial and municipal codes and shop drawings, industry practices, and manufacturers' documentation.

Required Knowledge

K 1	knowledge of types of drawings such as site, architectural, structural and mechanical
K 2	knowledge of reports such as soils, hazardous materials and inspection
K 3	knowledge of drawing components such as lines, symbols, legends and schedules
K 4	knowledge of manufacturers' specifications
K 5	knowledge of types of specification tables
K 6	knowledge of provincial, territorial and municipal building codes and regulations
K 7	knowledge of safety documentation such as MSDS, WHMIS symbols and safety manuals
K 8	knowledge of health and safety regulations
K 9	knowledge of workplace documentation such as site instructions, change orders and building permits
K 10	knowledge of risk assessment documentation

Sub-task

A-3.01 Interprets construction drawings.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-3.01.01	use drawing instruments such as protractors, scale rulers and T-squares
A-3.01.02	scale imperial and metric measurements from construction drawings for approximate measurements
A-3.01.03	locate information such as details, sections, door and window schedules and locations
A-3.01.04	draw sketches to relay information to co-workers
A-3.01.05	use drawings such as plans, details, elevations and sections
A-3.01.06	recognize conflicts between and priority of different types of drawings such as structural and architectural drawings
A-3.01.07	identify grid line locations to determine distances
A-3.01.08	use drawings to maintain correct elevations
A-3.01.09	interpret door and window schedules

Sub-task

A-3.02 Interprets specifications.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-3.02.01	use manufacturers' specifications such as product application and product identification
A-3.02.02	interpret and extract specific information such as products, materials and alternate products that can be used
A-3.02.03	locate information in specifications books and contracts

Sub-task

A-3.03 Applies building codes.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-3.03.01	remain current with building codes to ensure that the most recent information is being used
A-3.03.02	search and locate building code topics using the index efficiently and accurately
A-3.03.03	interpret national, provincial/territorial and municipal building codes and determine which has priority
A-3.03.04	interpret span tables to determine framing members required

Sub-task

A-3.04 Interprets safety and workplace documentation.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-3.04.01	remain current with safety and workplace documentation
A-3.04.02	locate and identify topics within safety and workplace documentation
A-3.04.03	use documentation to apply regulations and requirements
A-3.04.04	use WHMIS documents such as MSDS and product labels to control product use and disposal
A-3.04.05	use "tailgate meeting" documents to remain current with workplace activities
A-3.04.06	use and write pre-job safety instructions and hazard assessments to determine the hazards and risks of task being performed
A-3.04.07	use site safety plan that is posted on the job site to identify location of safety equipment such as first aid station, eye wash station and muster station

Task 4 — Organizes work.

Related Components (including, but not limited to)	Work schedules, health and safety regulations, workplace health and safety documentation, workplace records, hoarding, guard rails, construction shack, temporary shelters and furniture, temporary toilet facilities, signage, temporary safety protection, temporary fencing, survey markers.

Required Knowledge

K 1	knowledge of basic geometry
K 2	knowledge of types of materials
K 3	knowledge of methods of communication such as verbal, written and electronic
K 4	knowledge of task requirements
K 5	knowledge of requirements of other trades
K 6	knowledge of project material delivery sequence
K 7	knowledge of federal, provincial and municipal health and safety acts and regulations
K 8	knowledge of safety manuals and procedures
K 9	knowledge of safety training requirements such as for confined space entry and equipment operation
K 10	knowledge of tagout and lockout procedures
K 11	knowledge of location of first aid supplies
K 12	knowledge of confined space practices
K 13	knowledge of how site work impacts environment
K 14	knowledge of methods of locating underground utilities
K 15	knowledge of excavation techniques
K 16	knowledge of site conditions such as soil types, water problems and shoring requirements
K 17	knowledge of company policy for documentation in regards to site conduct, substance abuse

Sub-task

A-4.01 Estimates materials.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-4.01.01	perform calculations such as area, perimeter and volume
A-4.01.02	record required quantities of materials
A-4.01.03	read construction drawings to determine and perform calculations such as number of wall studs, sheets of plywood and volume of concrete
A-4.01.04	determine material needs taking into account application of material, wastage and reuse of available material
A-4.01.05	document completed work that will be covered by later procedures by methods such as photos and shop drawings

Sub-task

A-4.02 Communicates with others.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-4.02.01	relate technical information in common language
A-4.02.02	complete work-related records such as "tailgate meeting" documents, incident reports and site inspection reports
A-4.02.03	communicate with supervisors and other tradespersons
A-4.02.04	consult with authorities having jurisdiction such as building inspectors and safety officers
A-4.02.05	mentor apprentices to assist them in learning the trade
A-4.02.06	operate two-way radios to communicate with co-workers
A-4.02.07	use recognized hand signals to communicate with crane operators and crew

Sub-task

A-4.03 Schedules work sequence.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-4.03.01	follow a sequence of steps to ensure an efficient and safe process, and a quality product
A-4.03.02	coordinate the delivery of materials to maintain schedule and sequencing of project
A-4.03.03	coordinate with other trades
A-4.03.04	estimate time to complete tasks according to schedule
A-4.03.05	adapt to changing environmental conditions such as rain, snow and wind
A-4.03.06	develop alternate plans to account for changes in schedule

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Sub-task

A-4.04 Maintains safe work environment.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-4.04.01	use barrier equipment and structures such as barricades, caution tape and bump rope
A-4.04.02	use PPE and safety equipment such as fall protection, fire extinguishers and eye wash station
A-4.04.03	install temporary heating, environmental protection and hoarding
A-4.04.04	install temporary lighting
A-4.04.05	follow safety procedures such as fall protection, confined space, lockout, material handling, and access and egress
A-4.04.06	identify and report hazards to prevent incidents
A-4.04.07	apply WHMIS procedures such as record keeping of MSDS, product identification, handling and disposal
A-4.04.08	comply with regulations such as occupational health and safety and jurisdictional regulations
A-4.04.09	keep worksite clean to ensure a safe, organized worksite environment

A-4.04.10	block, cover and label openings to avoid injury to workers and public
A-4.04.11	install ladders

Sub-task

A-4.05 **Performs site preparation.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-4.05.01	assess and locate existing utilities
A-4.05.02	plan access and egress to job site for safe movement of workers and efficient delivery of materials
A-4.05.03	construct and install temporary structures such as signage, furniture, guard rails, construction shack and outbuildings
A-4.05.04	arrange for temporary utilities such as electrical, heating, waste removal, water and toilets
A-4.05.05	plan for storage of building materials taking into consideration crane location, safety of workers and prefab area
A-4.05.06	prepare laydown area for materials and deliveries
A-4.05.07	clear site of obstructions
A-4.05.08	provide temporary protection of environment
A-4.05.09	install fencing, control gates and hoarding to prevent injury to the public and loss of materials and tools

Task 5 Performs layout.

Related Components All components apply.

Required Knowledge

K 1	knowledge of basic geometry
K 2	knowledge of basic survey theory
K 3	knowledge of local regulations regarding building locations
K 4	knowledge of types of materials

K 5	knowledge of methods of communication such as verbal, written and electronic
K 6	knowledge of task requirements
K 7	knowledge of requirements of other trades
K 8	knowledge of project material delivery sequence
K 9	knowledge of methods of locating underground utilities
K 10	knowledge of excavation techniques
K 11	knowledge of site conditions such as soil types, water problems and shoring requirements
K 12	knowledge of determining quarter points
K 13	knowledge of determining cantilever joints
K 14	knowledge of engineering floor systems
K 15	knowledge of stairwell opening to determine headroom
K 16	knowledge of reflective ceiling plans.
K 17	knowledge of type of stairs

Sub-task

A-5.01 Performs site layout.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-5.01.01	determine location from survey markers to provide reference for location of building and related structures such as curbs, light standards and sidewalks
A-5.01.02	use layout structures such as batter boards and string lines to determine building location
A-5.01.03	determine and calculate elevations and survey markers to provide accuracy
A-5.01.04	determine and maintain offsets and angles to ensure accuracy of layout

Sub-task

A-5.02 Lays out concrete formwork.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-5.02.01	work off elevations to determine locations such as beam pockets, height of concrete, embeds, tie spacing and mechanical voids
A-5.02.02	work off batter boards and grid lines to locate building components such as beams, walls, footings and rebar and anchor bolts
A-5.02.03	interpret and apply measurements from construction drawings to building site
A-5.02.04	mark locations using methods such as snapping lines and scribing concrete
A-5.02.05	transfer, establish and correct points of elevation during construction
A-5.02.06	determine elevation and location of falsework to ensure required camber and slope of concrete slabs
A-5.02.07	determine locations of voids and openings in slabs
A-5.02.08	determine locations of subtrade penetrations such as electrical, HVAC and plumbing

Sub-task

A-5.03 Lays out floor systems.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-5.03.01	determine quarter point for built-up beams
A-5.03.02	determine lengths and size of material required for built-up beams according to code and span table
A-5.03.03	mark locations of building components such as beams, joists, stairwells and chases
A-5.03.04	measure joist locations to ensure support for walls and to allow for openings
A-5.03.05	determine lengths of material required for built-up beams
A-5.03.06	determine location of framing members according to construction drawings to ensure structural integrity and efficient use of material
A-5.03.07	locate beam supports to transfer building loads to foundation

A-5.03.08	calculate stairwell opening such as headroom according to building code
A-5.03.09	calculate floor take-off for floor systems using lumber as per code requirements
A-5.03.10	check layout accuracy by performing checks such as back check, Pythagorean theorem (3-4-5) and measuring cross-diagonals
A-5.03.11	determine locations of subtrade penetrations such as electrical, HVAC and plumbing
A-5.03.12	determine location of sub-floor members

Sub-task

A-5.04 Lays out wall systems.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-5.04.01	perform calculations to determine measurements such as lintel sizes, length of wall, height of wall and location of rough openings
A-5.04.02	lay out stud locations and wall openings by marking wall plates using predetermined method
A-5.04.03	lay out interior walls in sequence to allow for their construction
A-5.04.04	determine location of framing members according to construction drawings to ensure structural integrity and efficient use of material
A-5.04.05	determine locations of subtrade penetrations such as electrical, HVAC and plumbing
A-5.04.06	determine the size of ceiling joist according to code

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Sub-task

A-5.05 Lays out ceiling systems.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-5.05.01	determine location of ceiling joists to ensure efficient use of materials
A-5.05.02	lay out bulkheads and ceiling openings

A-5.05.03	perform calculations to determine grid spacing and location for suspended ceilings
A-5.05.04	determine elevations of drop and suspended ceilings using the appropriate levelling method
A-5.05.05	determine location of support drops for main tees taking into account fixture locations, aesthetics and weight load and by referring to construction drawings
A-5.05.06	determine locations of subtrade penetrations such as electrical, HVAC and plumbing

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Sub-task

A-5.06 **Lays out roof systems.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-5.06.01	perform calculations to determine measurements such as rafter length, overhang and projection taking into account shortening and adjustments
A-5.06.02	lay out rafters and roof openings according to construction drawings
A-5.06.03	lay out prefabricated truss roof system on wall plates
A-5.06.04	lay out bracing and blocking locations during installation of roof system
A-5.06.05	lay out roofing components such as gable ends, hip jacks, cripple jacks and saddle/crickets
A-5.06.06	lay out roof sheathing components

Sub-task

A-5.07 **Lays out stairs.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-5.07.01	measure total rise and run of stairs and length of stairwell opening
A-5.07.02	perform calculations to determine measurements such as unit rise, unit run, length of stringer and allowable headroom
A-5.07.03	determine location of landings for wood and concrete stairs

A-5.07.04	mark stringers using framing square and stair gauges and taking into consideration shortenings and adjustments
A-5.07.05	mark location of concrete stair stringer on the wall if present
A-5.07.06	lay out stringers for concrete stairs taking into account squareness of risers and kickers
A-5.07.07	determine location of soffit plywood for concrete stairs
A-5.07.08	determine placement of embeds in concrete stairs for components such as railings
A-5.07.09	lay out stringers for types of stairs such as geometric stairs and winders by performing various calculations
A-5.07.10	calculate stringers for geometric stairs and winders

Task 6 — Builds and uses temporary access structures.

Related Components (including, but not limited to)

Wood scaffolds (single pole, double pole, trestle), system scaffolds, bleachers, staging, frame scaffolds, tube and clamp scaffolds, ladders, ramps, temporary stairs, pump-jack scaffolds, suspended access systems (swing stage), wall brackets, roof brackets, form brackets, tagging systems, tie-ins, outriggers, bracing, mud sills, guard rail systems, rigging and hoisting equipment, ply deck, steel planks, scaffold grade wood planks.

Required Knowledge

K 1	knowledge of types of scaffold systems such as wood, platform and frame
K 2	knowledge of applicable standards, regulations and specifications
K 3	knowledge of effects of site conditions on scaffolding such as uneven and soft ground
K 4	knowledge of types of ladders, ramps and temporary stairs
K 5	knowledge of ladder regulations such as maintaining 3-point contact
K 6	knowledge of tie spacing with regards to hoarding and wind conditions
K 7	knowledge of engineer scaffold systems
K 8	knowledge of inspection and maintenance procedures

Sub-task

A-6.01 Uses ladders and temporary stairs and ramps.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-6.01.01	construct, install and secure site-built ladders, and temporary ramps and stairs according to code and jurisdictional regulations
A-6.01.02	ensure ladders are designed for intended use
A-6.01.03	maintain ladders by methods such as proper storage, use and handling
A-6.01.04	install ladders following OH&S guidelines such as angle, projection above access point and tying off at required points
A-6.01.05	inspect ladder for defects such as splits, and bent and missing rungs and remove ladder from service

Sub-task

A-6.02 Erects/dismantles scaffolding.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

A-6.02.01	select types of scaffold systems and components for task
A-6.02.02	erect scaffolding in proper sequence, ensuring it is stable, level and plumb
A-6.02.03	tie scaffold according to code, regulation and manufacturer's specifications
A-6.02.04	dismantle scaffolding in proper sequence to ensure safety of workers
A-6.02.05	use double lanyard system of fall protection when working with scaffolding equipment
A-6.02.06	identify and fill-in tagging systems to inform others of condition of scaffolding
A-6.02.07	inspect and maintain scaffold components such as screw jacks, safety catches, braces and decks for missing, damaged or altered components
A-6.02.08	apply damage tags to damaged scaffold components to ensure they are removed from service

BLOCK B CONCRETE

Context

This block describes building the forms that contain concrete, and installing the concrete into these forms.

The formwork must be built with attention to detail and to specifications. Carpenters often go beyond the minimally specified requirements for reasons such as safety and to prevent blowouts.

Trends

ICFs - which incorporate insulation, attachment points (studs) and membranes in the forms - are becoming more mainstream, especially in residential applications. New innovations in formwork systems are being introduced; carpenters must continually learn about new components and applications of these systems. Self-consolidating concrete has been introduced to the construction industry.

Building codes are being updated to require radon proofing measures in homes including; an air barrier between the building envelope and adjacent soil, requirements for sealing all penetrations through the slab and below grade walls, installation of a permeable layer of granular material under basement floors, and the installation of a capped pipe through the slab to allow for the installation of an active mitigation system should it prove to be required.

Tools and Equipment

See Appendix A.

Task 7 — Constructs formwork.

Related Components (including, but not limited to)	Strip footings, pier footings, column footings, battered footings, step footings, steel forms, fibre forms, wood forms, tilt-up forms, pan forms, pre-fabricated forms, gang forms, fly forms, core forms, built-in-place forms, ICFs, slip forms, non-slip stair inserts, void forms, anchor bolts, dowels, angle irons, plates, form ties, reinforcing steel rods, welded wired mesh (WWM), miscellaneous inserts, chases, coil ties, snap ties, water stops, keyways, strongbacks, walers, taper ties, capitals, caissons, control joints, bracing, rough bucks, bulkheads, chamfer strips, shoring, shoring scaffolding, falsework, wire mesh, threaded rod, pencil rod, buttons, connectors, floor slabs, walls, slabs-on-grade, suspended slabs, grade beams, manufacturer-specific forms, underpinning.

Required Knowledge

K 1	knowledge of types and components of shoring
K 2	knowledge of shoring scaffolding components such as frame scaffolding, bracing, u-heads and base jacks
K 3	knowledge of shoring techniques
K 4	knowledge of excavation shoring and underpinning
K 5	knowledge of types of footing forms
K 6	knowledge of types of piles such as steel, wood and concrete
K 7	knowledge of formwork material such as wood, steel, aluminium, composite and foam
K 8	knowledge of wall form systems such as slip forms, gang forms, ICF and tilt-up formwork
K 9	knowledge of form release agents
K 10	knowledge of building and stripping sequence of formwork
K 11	knowledge of tie systems
K 12	knowledge of void forms under grade beams and slabs
K 13	knowledge of types of slab formwork
K 14	knowledge of nailing requirements
K 15	knowledge of manufacturers' specifications and code requirements
K 16	knowledge of formwork components such as capitals, piers, columns pilasters, beams, girders and corbels
K 17	knowledge of joints such as expansion, control and isolation joints construction
K 18	knowledge of yoking (collaring)
K 19	knowledge of types of stair and landing forms

K 20	knowledge of form hardware
K 21	knowledge of forming techniques such as using inverted stringer
K 22	knowledge of local codes, building codes and regulation requirements
K 23	knowledge of concrete properties
K 24	knowledge of embedded steel placing procedures
K 25	knowledge of grades of reinforcing steel
K 26	knowledge of tension and compression related to reinforcing steel materials
K 27	knowledge of pre-stressed and post-stressed concrete applications
K 28	knowledge of accessories such as chairs, stirrups and sleeves
K 29	knowledge of grouting and epoxies
K 30	knowledge of stripping techniques
K 31	knowledge of rigging equipment
K 32	knowledge of hazards associated with erecting and dismantling of formwork
K 33	knowledge of layout procedures for embedments such as anchors
K 34	knowledge of elevation according to construction drawing

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Sub-task

B-7.01 Erects excavation shoring and underpinning.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

B-7.01.01	select materials according to soil conditions, depth of excavation and specifications, and safety regulations
B-7.01.02	inspect materials for structural integrity
B-7.01.03	provide access and egress prior to erecting shoring
B-7.01.04	fasten excavation shoring firmly in place using fasteners such as rock anchors, bolts and pilings
B-7.01.05	place shoring to contain loose debris with appropriate materials such as chicken wire and chain link

Sub-task

B-7.02 Erects concrete shoring.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

B-7.02.01	determine soil conditions required for support of shoring to prevent settling and movement of structure
B-7.02.02	identify site-specific shoring requirements including engineered shoring and re-shoring drawings such as for suspended slab and stair formwork
B-7.02.03	prepare mud sills and sleepers where required for weight distribution
B-7.02.04	select materials required for shoring such as strongbacks, lateral bracing, standards, and shoring jacks and frames
B-7.02.05	place shoring and ensure components are plumb, level and square according to engineers' requirements
B-7.02.06	fasten components using fasteners such as duplex nails and threaded rod for ease of dismantling
B-7.02.07	re-shore after stripping of forms according to engineers' requirements until curing of concrete has occurred
B-7.02.08	remove shoring after curing of concrete

Sub-task

B-7.03 Constructs footing forms.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

B-7.03.01	select materials according to site-specific requirements such as soil conditions and size of footing
B-7.03.02	place formwork and ensure components are plumb, level, square and accessible for finishing work
B-7.03.03	determine height of the top of the footing in the excavation in order to maintain efficient use of materials
B-7.03.04	place bracing to maintain square and level footing
B-7.03.05	brace step footings to maintain plumb, square and level and to prevent blowouts and sag

B-7.03.06	install required components such as keyways, water stops, templates, bulkheads and miscellaneous inserts
B-7.03.07	fasten components using fasteners such as duplex nails and threaded rod for ease of dismantling
B-7.03.08	inspect assembled formwork for deficiencies

Sub-task

B-7.04 Constructs wall and grade beam formwork.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

B-7.04.01	follow chalk line and cut or select forms to achieve required measurement
B-7.04.02	apply release agents to allow for reuse of forms
B-7.04.03	place sleepers and void forms under grade beams to allow for frost heave
B-7.04.04	install keyways and joints in wall forms
B-7.04.05	place formwork and ensure components are plumb, level, square and accessible for placing, finishing and curing
B-7.04.06	assemble prefabricated forms before installation
B-7.04.07	install window and door bucks, penetrations, water stops and bulkheads
B-7.04.08	install form restraints such as snap ties, coil ties and taper ties
B-7.04.09	install bracing such as turnbuckles, standards, strongbacks and kickers in order to support formwork in place and according to specifications
B-7.04.10	install spreader bars, blocks or ladder at top of formwork in order to maintain required wall thickness
B-7.04.11	inspect formwork components and installation in order to prevent blowouts and distortion
B-7.04.12	determine finish elevation by using methods such as chamfer strips, brick ledge and grade nails
B-7.04.13	inspect assembled formwork for deficiencies
B-7.04.14	determine when engineers' design is required

Sub-task

B-7.05 Constructs slab-on-grade formwork.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

B-7.05.01	ensure that substrate is prepared with granular fill and compacted according to specifications and code
B-7.05.02	place void forms for frost protection to allow for frost heave
B-7.05.03	select materials for formwork according to specifications
B-7.05.04	apply products such as polyethylene under the slab to serve as an air and moisture barrier
B-7.05.05	place formwork and ensure components are plumb, level and square and accessible for finishing work
B-7.05.06	place inserts such as anchor bolts, sleeves and weld plates
B-7.05.07	install required components such as keyways, water stops, bulkheads, screed level pegs and miscellaneous inserts
B-7.05.08	apply products such as extruded polystyrene (XPS) under the slab to prevent heat loss
B-7.05.09	install joints such as control joints and expansion joints in order to control or prevent cracking due to movement
B-7.05.10	lock corners of forms in order to prevent blowouts and maintain required slab shape such as raft slabs (over size)
B-7.05.11	install bracing such as kickers and threaded rods in order to support formwork in place and according to specifications
B-7.05.12	ensure that other trades have all below-grade services installed such as sump pit, drains, electrical conduit and hydronic heating
B-7.05.13	inspect assembled formwork for deficiencies
B-7.05.14	establish finish elevation

Sub-task

B-7.06 Constructs suspended slab formwork.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

B-7.06.01	select materials for falsework according to site conditions and formwork design according to codes and regulations
B-7.06.02	ensure that other trades have all cast-in services installed such as drains, electrical conduit and hydronic heating
B-7.06.03	apply release agents for reuse of forms
B-7.06.04	place formwork and ensure components are plumb, level, square and accessible for finishing work
B-7.06.05	place post-tensioned and pre-stressed component
B-7.06.06	form beams, girders, columns and capitals to facilitate removal of forms using procedures such as chasing form corners and using saw kerfs
B-7.06.07	place post-tensioning components and inserts such as embeds, sleeves, weld plates, chases and other openings
B-7.06.08	install joints such as construction and expansion joints in order to control or prevent cracking due to movement
B-7.06.09	inspect assembled formwork for deficiencies according to engineers' requirements

Sub-task

B-7.07 Constructs column formwork.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

B-7.07.01	determine location of column forms according to specifications and construction drawings
B-7.07.02	select materials for falsework according to site conditions and formwork design according to codes and regulations
B-7.07.03	apply release agents for reuse of forms

B-7.07.04	place formwork components such as chamfer strips, reveal strips, and embeds and ensure all are plumb, level, square and accessible for finishing work
B-7.07.05	select fasteners such as banding, bolts and threaded rods for securing formwork according to site requirements
B-7.07.06	install access scaffold to facilitate concrete placement
B-7.07.07	brace column formwork in multiple directions in order to stabilize the formwork and prevent any movement
B-7.07.08	verify formwork is plumb, level and square according to engineers' requirements
B-7.07.09	apply templates in column formwork according to plans
B-7.07.10	inspect assembled formwork for deficiencies

Sub-task

B-7.08 Constructs stair formwork.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

B-7.08.01	place and secure formwork such as inverted stringers, soffits, risers, treads and nosings and ensure components are plumb, level, square and accessible for finishing work
B-7.08.02	select materials for falsework according to site conditions and formwork design
B-7.08.03	apply release agents for ease of removal and to allow for reuse of forms
B-7.08.04	apply bracing such as kickers in order to support formwork in place and according to specifications
B-7.08.05	install formwork components such as chamfer strips, reveal strips and embeds
B-7.08.06	inspect assembled formwork for deficiencies

Sub-task

B-7.09 Installs embedded steel.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

B-7.09.01	select reinforcing steel material according to specifications
B-7.09.02	select and install chairs to ensure proper coverage of reinforcing steel
B-7.09.03	calculate overlaps required for reinforcing steel or wire mesh
B-7.09.04	cut and bend reinforcing steel or wire mesh on site as required using equipment such as benders, quick-cut saws and grinders
B-7.09.05	tie reinforcing steel to ensure continuity using types of ties such as saddle, cross-lap and figure eight
B-7.09.06	place inserts such as angle iron, anchor bolts and structural steel weld plates
B-7.09.07	install reinforcing components such as stirrups, and vertical and horizontal bars
B-7.09.08	inspect reinforcing steel for defects such as dirt, debris, rust and corrosion before installation
B-7.09.09	place embedded steel according to drawings and specifications such as tension and compression considerations

Sub-task

B-7.10 Dismantles/maintains formwork.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

B-7.10.01	remove nails and fasteners
B-7.10.02	remove structural members in reverse order from assembly according to engineers' instructions
B-7.10.03	install reshoring according to drawings and specifications
B-7.10.04	rig, hoist and move fly forms for relocation
B-7.10.05	scrape and sweep forms to remove excess concrete
B-7.10.06	repair damaged forms by replacing components such as plywood, strongbacks and walers

B-7.10.07	apply form oil after cleaning
B-7.10.08	refurbish architectural forms to ensure quality of finish
B-7.10.09	store forms and forming materials in organized fashion for future use

Task 8 — Installs concrete, cement-based and epoxy products.

Related Components (including, but not limited to)

Concrete, lightweight concrete, hollow core slab, pre-cast, tilt-up walls, backer rod, caulking, grout, epoxies, steel shims, braces, anchors, accelerators, hardeners, plasticizers, retarders, air entrainment, miscellaneous inserts, form release agents, reinforcing additives (fibre and steel).

Required Knowledge

K 1	knowledge of types of concrete and mix designs
K 2	knowledge of rate of pour
K 3	knowledge of concrete placement procedures
K 4	knowledge of testing procedures such as slump and compressive strength
K 5	knowledge of additives
K 6	knowledge of types of finishes such as broom, stamped and exposed aggregate
K 7	knowledge of lateral pressures
K 8	knowledge of compressive strength
K 9	knowledge of hot and cold weather curing techniques such as ponding and insulating
K 10	knowledge of climate protection techniques such as hoarding and heating
K 11	knowledge of effects of climatic conditions
K 12	knowledge of crane hand signals and rigging points
K 13	knowledge of quarter-points
K 14	knowledge of types of pre-cast systems
K 15	knowledge of pre-stressed and post-stressed concrete
K 16	knowledge of layout procedures
K 17	knowledge of types of grout such as drypack, expanding and liquid grout
K 18	knowledge of types of grouting procedures

K 19	knowledge of grout additives
K 20	knowledge of concrete repair materials and techniques

Sub-task

B-8.01 Places concrete.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

B-8.01.01	plan pour taking into consideration factors such as location of equipment, starting point, sequence of pour and rate of pour
B-8.01.02	add additives such as plasticizers, hardeners, accelerators and curing agents
B-8.01.03	perform slump test on concrete before starting pour to maintain integrity of desired mix design
B-8.01.04	assign responsibility for pour watch
B-8.01.05	use placement methods such as using concrete pump, crane and bucket, wheelbarrow and chute
B-8.01.06	vibrate concrete to consolidate concrete and eliminate voids around locations such as beam pockets, chases and bucks, while avoiding over-vibrating, segregation and blowouts
B-8.01.07	recognize signs of an impending blowout such as deformation, deflection and leakage and take remedial measures
B-8.01.08	place joints in poured concrete such as expansion, isolation and control joints
B-8.01.09	double check after concrete is placed for straightness and dimensions of walls and columns and make adjustments to achieve plumb, level and square formwork

Sub-task

B-8.02 **Facilitates curing of concrete.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

B-8.02.01	assess environmental conditions to determine protection needed for curing
B-8.02.02	install temporary heating systems to meet seasonal conditions
B-8.02.03	lay out and install control joints according to drawings and specifications
B-8.02.04	cover curing concrete with materials such as wet burlap, polyethylene or thermal blankets
B-8.02.05	set up water systems such as ponding and soaker hose to maintain a wet cure
B-8.02.06	apply chemical curing compounds and sealants according to specifications

Sub-task

B-8.03 **Performs basic concrete finishing.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

B-8.03.01	screed and float concrete using specialized concrete finishing tools and equipment such as magnesium and bull float
B-8.03.02	use finishing additives such as colouring, aggregates and hardeners
B-8.03.03	apply architectural finishing techniques such as exposed aggregate, broom finish and edging
B-8.03.04	apply appropriate patching products to patch/repair concrete

Sub-task

B-8.04 Installs pre-cast components.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

B-8.04.01	organize sequence of work for placing pre-cast components
B-8.04.02	identify location of pick-points of pre-cast components and erection procedures
B-8.04.03	determine elevation of installation location
B-8.04.04	align, shim and brace pre-cast components
B-8.04.05	fasten pre-cast components securely
B-8.04.06	install isolation joints with specified sealants and caulking to prevent water infiltration

Sub-task

B-8.05 Installs grout.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

B-8.05.01	select grout and additives according to job requirements, drawings and specifications
B-8.05.02	select, construct and install grout forms
B-8.05.03	prepare surface to be grouted by cleaning and brushing on a bonding agent
B-8.05.04	use grout placement methods such as using grout forms, pumping, hand trowelling and dry packing
B-8.05.05	apply appropriate backup material when installing grout on foam insulation products, such as those used for exterior insulated basements

BLOCK C — FRAMING

Context

This block describes the activities that relate to the cutting and assembly of various members to construct floor, wall, roof and ceiling framing.

Trends

Energy-efficient building designs and practices including "advanced framing" have become more common.

Engineered lumber is becoming more commonplace due to reasons such as architectural design, strength and span.

Building wall and roof sections on the ground and lifting them in place with a crane is becoming more common due to safety and efficiency concerns.

Tools and Equipment

See Appendix A.

Task 9 — Constructs floor systems.

Related Components (including, but not limited to)

Floor joists, headers, trimmers, cripples, beams, bridging, blocking, strongbacks (horizontal bracing), columns, sill plates, I-joists, trusses, sheathing, joist hangers, framing anchors, squash blocks, adhesives.

Required Knowledge

K 1	knowledge of types of floor systems
K 2	knowledge of manufacturers' specifications
K 3	knowledge of national, provincial and municipal building codes
K 4	knowledge of beam supports such as steel and wood
K 5	knowledge of types of beams such as steel, built-up and engineered
K 6	knowledge of load bearing wall requirements
K 7	knowledge of special connectors and supports such as joist hangers and manufacturer-specified fasteners
K 8	knowledge of components such as blocking, backing, strapping, bridging and back framing
K 9	knowledge of species of wood and their properties

K 10	knowledge of cantilever of beams and joists
K 11	knowledge of floor sheathing
K 12	knowledge of components of post and beam framing

Sub-task

C-9.01 Installs engineered floor systems.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

C-9.01.01	assess pre-existing conditions such as plumb, level and square to determine if special action needs to be taken in framing
C-9.01.02	follow specified sequence of installation and structural specifications for components such as plates, gaskets and anchor bolts
C-9.01.03	check for layout conflicts such as plumbing, electrical and HVAC penetrations
C-9.01.04	frame rough openings such as for stairwells and chimneys according to drawings and specifications
C-9.01.05	follow engineering limitations and specifications for engineered floors
C-9.01.06	drill framing components for electrical and mechanical considerations according to manufacturer's specification
C-9.01.07	install lateral and vertical bracing such as strongback, blocking and backing according to manufacturer's specification and code
C-9.01.08	adjust floor system for existing site conditions such as out-of-square and out-of-level foundations
C-9.01.09	install engineered flooring components such as hangers and fasteners in accordance with manufacturers' specifications
C-9.01.10	place and secure sheathing on joists to maintain squareness and strength
C-9.01.11	install strongback as per manufacturer's specification

Sub-task

C-9.02 Constructs dimensional lumber floor framing.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

C-9.02.01	assess and adjust pre-existing conditions such as plumb, level and square to determine if special action needs to be taken in framing
C-9.02.02	follow sequence of installation and structural specifications
C-9.02.03	check for layout conflicts such as plumbing, electrical and HVAC penetrations
C-9.02.04	install floor members crown up
C-9.02.05	place bows in joists in opposition when attached to each other in order to cancel each other out
C-9.02.06	adjust for existing site conditions such as out-of-square and out-of-level foundations
C-9.02.07	install fasteners for floor framing according to code requirements such as nail frequency and patterns, and beam spans
C-9.02.08	install joist restraints such as cross-bridging, blocking, strapping and backing
C-9.02.09	frame rough openings such as for stairwells and chimneys according to drawings and specifications
C-9.02.10	notch and drill framing components according to code
C-9.02.11	follow code requirements and limitations for dimensional lumber floor framing
C-9.02.12	place and secure sheathing on joists to maintain squareness and strength

Task 10 Constructs wall systems.

Related Components (including, but not limited to)

Plates, studs, structural insulated panel systems (SIPS), blocking, furring/strapping, sheathing, bracing, back framing, lintels, tracks, stiffeners, fire stops, jacks, post and beam components, connectors.

Required Knowledge

K 1	knowledge of types of wall systems such as strapped, double-wall, platform, balloon, timber, steel stud, curtain and panel
K 2	knowledge of materials used in wall systems
K 3	knowledge of door and window rough opening clearances
K 4	knowledge of blocking, backing and back framing requirements
K 5	knowledge of preserved wood foundations
K 6	knowledge of manufacturers' specifications and building codes
K 7	knowledge of beam supports such as steel, wood and concrete
K 8	knowledge of types of beams such as steel, built-up and engineered
K 9	knowledge of load bearing wall requirements
K 10	knowledge of framing requirements for openings
K 11	knowledge of notching and drilling requirements
K 12	knowledge of fastening requirements
K 13	knowledge of fire stops
K 14	knowledge of components of post and beam framing

Sub-task

C-10.01 Installs engineered wall systems.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

C-10.01.01	assess and adjust pre-existing conditions such as plumb, level and square to determine if special action needs to be taken in framing
C-10.01.02	check for layout conflicts such as plumbing, electrical and HVAC penetrations
C-10.01.03	follow specified sequence of installation and structural specifications

C-10.01.04	follow engineering drawings and specifications for engineered wall systems
C-10.01.05	frame rough openings such as for doors and windows according to specifications
C-10.01.06	install lateral bracing
C-10.01.07	assess and adjust wall system for existing site conditions such as out-of-square and out-of-level foundations or floor frames
C-10.01.08	fit and secure panels together
C-10.01.09	install temporary bracing to maintain plumb, level, square and secure wall panels
C-10.01.10	install engineered wall components such as hangers and fasteners in accordance with manufacturers' specifications
C-10.01.11	install lintel bearing directly on supporting members according to building code
C-10.01.12	seal wall frame system with compounds such as spray foam and acoustical sealant
C-10.01.13	assemble pre-fabricated wall systems such as SIPS
C-10.01.14	make allowances for vapour-diffusion retarders (VDR) such as polyethelene and air barriers

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Sub-task

C-10.02 Constructs dimensional lumber wall framing.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

C-10.02.01	follow specified sequence of installation and structural specifications
C-10.02.02	check for layout conflicts such as plumbing, electrical and HVAC penetrations
C-10.02.03	install wall members crown up
C-10.02.04	assess and adjust wall framing for existing site conditions such as out-of-square and out-of-level foundations
C-10.02.05	install fasteners for wall framing according to code requirements such as nailing patterns for lintels and built-up beams
C-10.02.06	install gaskets, sill plates and anchor bolts
C-10.02.07	frame rough openings such as for doors and windows according to specifications

C-10.02.08	notch and drill framing components according to code requirements
C-10.02.09	install stud restraints such as blocking and strapping
C-10.02.10	place and secure sheathing on joists to maintain squareness and strength
C-10.02.11	install temporary bracing as required during erection
C-10.02.12	install back framing in exterior and interior walls to provide proper support for interior finish components
C-10.02.13	make allowances for and install VDRs such as polyethelene, air barriers and fire stop materials
C-10.02.14	square, level and plumb walls

Task 11 Constructs roof and ceiling systems.

Related Components (including, but not limited to)

Rafters, ridge board, SIPS, collar ties, trusses, gable studs, soffits, fascias, roof joists, ceiling joists, gussets, blocking, attic access, dormers, bracing, flush beams, joist hangers, hurricane clips, strapping, sheathing, webs, saddles/crickets, scuppers, reglets, parapet walls, specialty framing.

Required Knowledge

K 1	knowledge of types of roof and ceiling systems
K 2	knowledge of types of roof members such as trusses and various rafters
K 3	knowledge of types of ceiling members such as ceiling joists
K 4	knowledge of framing requirements for openings
K 5	knowledge of manufacturers' specifications
K 6	knowledge of national, provincial and municipal codes
K 7	knowledge of beam supports such as steel and wood
K 8	knowledge of types of beams such as steel, built-up and engineered
K 9	knowledge of load bearing wall requirements
K 10	knowledge of special connectors and supports such as joist hangers, hurricane clips and H-clips
K 11	knowledge of roofing components such as blocking, backing, strapping and saddles/crickets
K 12	knowledge of marking techniques
K 13	knowledge of blocking, backing and back framing requirements
K 14	knowledge of framing requirements for openings

K 15	knowledge of notching and drilling requirements
K 16	knowledge of components of post and beam framing

Sub-task

C-11.01 Installs engineered trusses.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

C-11.01.01	follow specified sequence of truss installation according to structural specifications and engineering limitations
C-11.01.02	assess pre-existing conditions such as plumb, level and square to determine if special action needs to be taken in framing
C-11.01.03	adjust trusses for existing site conditions such as out-of-square and out-of-level walls
C-11.01.04	fit and secure girders and sections together
C-11.01.05	align trusses to ensure straight fascia
C-11.01.06	install fascia boards
C-11.01.07	install temporary bracing to maintain plumb, level, square and secure trusses
C-11.01.08	install permanent lateral and angle bracing
C-11.01.09	frame rough openings such as for attic access, skylights and chimneys according to specifications
C-11.01.10	install truss components such as hangers and fasteners in accordance with manufacturers' specifications
C-11.01.11	install back frame trusses using materials such as insulation stops, cross-bracing and directional blocking

Sub-task

C-11.02 Constructs roof and ceiling framing.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

C-11.02.01	select species and size of lumber according to code
C-11.02.02	follow specified sequence of installation and structural specifications
C-11.02.03	assess pre-existing conditions such as plumb, level and square to determine if special action needs to be taken in framing
C-11.02.04	determine measurements and cuts using framing square
C-11.02.05	adjust roof framing for existing site conditions such as out-of-square and out-of-level walls
C-11.02.06	cut members to specifications
C-11.02.07	align tails of roof members to ensure straight fascia
C-11.02.08	install fasteners for roof framing according to code requirements such as nail frequency and patterns
C-11.02.09	install temporary bracing to maintain plumb, level, square and secure roof members
C-11.02.10	install permanent lateral and angle bracing such as collar ties and purlins
C-11.02.11	frame rough openings such as for attic access, skylights and chimneys according to specifications
C-11.02.12	back frame using materials such as insulation stops, fire stops, cross-bracing and directional blocking
C-11.02.13	install equal and unequal slope intersecting roof components
C-11.02.14	install fascia boards
C-11.02.15	place sheathing perpendicular to rafters to maintain structural integrity
C-11.02.16	construct and install parapet walls and cant strips for flat roofs
C-11.02.17	ensure adequate venting

BLOCK D — EXTERIOR FINISH

Context — This block describes all of the activities which relate to the finishing of the building exterior, including cladding, soffit, roofing, exterior doors and windows.

Trends — There is a movement towards the use of new building products such as cement board siding and recycled materials for shingles cladding, which requires special health and safety precautions.

Tools and Equipment — See Appendix A.

Task 12 — Installs exterior doors and windows.

Related Components (including, but not limited to) — Overhead doors, sliding doors, swinging doors, weather stripping, hinges, closers, electronic devices, window operators, locksets, thresholds, emergency exit devices, protection plates, door stops, kick plates, astragal, barrier-free devices, fixed windows, double-hung windows, casement windows, awning windows, hopper windows, sliding windows, pivoting windows, flush bolts, templates, insulation (backer rod, expanding foam, batt), sealants.

Required Knowledge

K 1	knowledge of types of window and door jambs/frames and their application
K 2	knowledge of types of exterior doors and their application
K 3	knowledge of different installation procedures
K 4	knowledge of exterior door components
K 5	knowledge of weather protection techniques such as installing flashing and weather stripping
K 6	knowledge of air and vapour barriers
K 7	knowledge of types of exterior windows and their application
K 8	knowledge of exterior window components
K 9	knowledge of types and styles of exterior door and window hardware such as locks, latches and keyless entry systems

K 10	knowledge of subtrade requirements for window and door installation
K 11	knowledge of exterior door and window schedules
K 12	knowledge of code requirements
K 13	knowledge of barrier-free access requirements
K 14	knowledge of manufacturers' specifications

Sub-task

D-12.01 Installs exterior jambs/frames.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

D-12.01.01	assess rough openings conditions such as size, plumb, level and square to determine if special action needs to be taken in installation of jambs/frames
D-12.01.02	adjust rough opening for existing site conditions such as out-of-square and out-of-level
D-12.01.03	install blocking, backing and air barrier before securing jambs
D-12.01.04	install blocking and backing before securing jambs and/or frames
D-12.01.05	prepare hinges and bolt locations on metal frame doors to protect from grout
D-12.01.06	brace metal door frame in concrete block applications to ensure plumb and adequate support over door frame
D-12.01.07	ensure adjacent jambs or frames are aligned with each other
D-12.01.08	level header jamb and plumb side jamb
D-12.01.09	secure jambs/frames by shimming and fastening to steel, wood and masonry
D-12.01.10	insulate cavity around jambs/frames to create a thermal break or fire stop

Sub-task

D-12.02 Installs exterior doors.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

D-12.02.01	determine door size, swing and location according to door schedule
D-12.02.02	mark door slab and jamb for hinge location
D-12.02.03	mortise hinge gains on slab and jambs
D-12.02.04	secure door to jamb using fasteners such as screws and hinges
D-12.02.05	install weather protection devices such as weather stripping and door sweep
D-12.02.06	install door accessories such as astragals, kick plates and stops

Sub-task

D-12.03 Installs specialty exterior doors.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

D-12.03.01	identify type of specialty exterior doors such as overhead doors, access hatch and bypass doors
D-12.03.02	assess and adjust rough openings conditions such as size, plumb, level and square to determine if special action needs to be taken in installation of specialty exterior doors
D-12.03.03	adjust rough opening for existing site conditions such as out-of-square and out-of-level
D-12.03.04	determine door size and location according to schedule
D-12.03.05	follow manufacturers' installation instructions and specifications
D-12.03.06	secure door components using fasteners such as screws, bolts and anchors
D-12.03.07	install weather protection devices such as weather stripping and door sweep

Sub-task

D-12.04 Installs exterior windows.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

D-12.04.01	assess and adjust rough openings conditions such as size, plumb, level and square to determine if special action needs to be taken in installation of exterior windows
D-12.04.02	adjust rough opening for existing site conditions such as out-of-square and out-of-level
D-12.04.03	ensure adjacent jambs or frames are aligned with each other
D-12.04.04	place and secure window in rough opening using shims and fasteners to level and plumb
D-12.04.05	install lintel flashing over top of window
D-12.04.06	apply weather protection such as base flashing, air barriers, back caulking and gaskets
D-12.04.07	insulate cavity around frames to create a thermal break or fire stop

Sub-task

D-12.05 Installs exterior door and window hardware.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

D-12.05.01	select hardware such as locks, closures and emergency devices
D-12.05.02	position hardware using equipment such as templates and mortising jigs
D-12.05.03	secure the hardware to door or window
D-12.05.04	adjust hardware to ensure smooth operation

Task 13 Installs roofing.

Related Components (including, but not limited to)

Eave protection, felt paper, flashing, insulation, caulking, ventilation, strapping, furring, cant strip, drip edge, tar paper, saddles/crickets, soffit baffles, low slope roofing, glass panel, skylights, membrane systems, metal roof, shingles (asphalt, metal, wood), scuppers, parapet walls.

Required Knowledge

K 1	knowledge of types of roofing materials such as asphalt, wood and metal
K 2	knowledge of roofing installation and repair procedures
K 3	knowledge of types of components, fasteners and their applications such as vents, flashing, roofing nails and underlayments
K 4	knowledge of code requirements
K 5	knowledge of sequence of installation
K 6	knowledge of safety requirements such as fall protection, toe boards on scaffolding and 3-point contact on ladders
K 7	knowledge of handling and placement requirements for roofing materials

Sub-task

D-13.01 Installs roofing components.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

D-13.01.01	select appropriate roof venting products, according to location, specifications, and type and size of roof
D-13.01.02	select underlayment materials such as eave protection, felt paper and strapping
D-13.01.03	apply underlayment materials to prevent damage such as ice damming and water penetration
D-13.01.04	select flashing such as drip edge, step flashing and cap flashing according to location, specifications and type of roof
D-13.01.05	apply flashing components using related fasteners and sealants
D-13.01.06	mount exterior ventilation components such as ridge vent and exhaust vents

Sub-task

D-13.02 Installs roof coverings.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

D-13.02.01	select roofing materials such as asphalt shingles and metal according to construction drawings and specifications
D-13.02.02	select fasteners according to roofing material selected
D-13.02.03	secure metal roofing materials such as corrugated and steel tile according to manufacturers' specifications
D-13.02.04	secure asphalt roofing materials such as shingles and rolled roofing according to manufacturers' specifications
D-13.02.05	install starter strip, drip edge, flashing and caulking according to drawings and project specifications and manufacturers' instructions
D-13.02.06	install ridge and hip caps according to project specifications and in accordance with manufacturers' instructions

Task 14 Finishes exterior walls and cornices.

Related Components (including, but not limited to)

Eaves, vents, parapet walls, flashing, awnings, trim accessories, cladding (metal, wood, vinyl, composite, cementitious), soffits, panelized insulation, shingles, air/weather barriers, soffit venting, fascia, friezeboard, stucco, rain screen.

Required Knowledge

K 1	knowledge of types of cladding such as siding and shingles
K 2	knowledge of effects of weather on exterior walls and protection such as rain screens and flashing
K 3	knowledge of types of exterior trims such as friezeboard, starter strip and mouldings
K 4	knowledge of sequence of installation
K 5	knowledge of installation procedures for exterior claddings
K 6	knowledge of types of fasteners such as sheathing tape, and electro-galvanized and ring nails

K 7	knowledge of safety requirements such as fall protection, toe boards on scaffolding and 3-point contact on ladders
K 8	knowledge of types of wall membranes, adhesives and sealants such as air barrier, tar paper and silicone caulking
K 9	knowledge of speciality tools such as snap-lock punch, zip tool and slot punch

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Sub-task

D-14.01 Installs exterior wall trims.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

D-14.01.01	check for plumb, level and square structure to ensure efficient use of material and aesthetics
D-14.01.02	select wall trims such as vinyl, wood and composite products by referring to construction drawings and specifications
D-14.01.03	select corrosive-resistant fasteners such as galvanized, stainless steel and aluminium
D-14.01.04	apply strapping, furring, insulation and flashings as required for reasons such as warranty requirements, for weather protection (rain screen) and for energy efficiency
D-14.01.05	apply caulking products to protect joints and penetrations

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Sub-task

D-14.02 Installs exterior wall coverings.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

D-14.02.01	select wall coverings such as vinyl, wood and composite products by referring to construction drawings and specifications
D-14.02.02	refer to and conform to manufacturers' specifications to ensure product performs as designed and meets warranty requirements
D-14.02.03	select corrosive-resistant fasteners such as galvanized, stainless steel and aluminium

D-14.02.04	apply wall coverings using methods such as staggered joints, storey pole, laser level and string lines to ensure strength and aesthetics
D-14.02.05	prepare joints such as butt, scarf, mitre and lap based on product requirements
D-14.02.06	apply caulking products to protect joints and penetrations

BLOCK E INTERIOR FINISH

Context

This block describes all of the activities which relate to the finishing of the interior walls, ceilings and floors, and to the installation of interior trims, cabinets, and interior doors and windows.

Trends

There is a movement towards the use of new building products, which requires special health and safety precautions. There is an increased use of recycled materials and solid surface products such as bamboo wood, tiles, concrete and laminates.

There has been an increase in the use of pre-finished and prefabricated materials.

Tools and Equipment

See Appendix A.

Task 15 Applies wall/ceiling finishes.

Related Components (including, but not limited to)

Gypsum board, sound (acoustical) panels, cork, fibreglass reinforced panels (FRP), vinyl panels, plywood, solid wood, book match panels, metal panels, ceiling grid, sound baffles, resilient channel, vinyl wall board, aluminium door frames (as they apply to demountable walls), adhesives, screws, nails, anchors, moulding, main T's, cross T's, splines, carrying channels, hat track (furring/resilient channel), tie wire, hanger wire, steel studs, track clips.

Required Knowledge

K 1	knowledge of types of gypsum coverings
K 2	knowledge of types of wall systems such as shaft wall, fire rated wall and sound wall
K 3	knowledge of sequence of installation
K 4	knowledge of fire stopping and fire proofing requirements such as 1 hour and 2 hour rating
K 5	knowledge of blocking requirements
K 6	knowledge of sound proofing methods such as resilient channels, sound batts and baffles

K 7	knowledge of types of panels and tiles such as hardboard, laminate and acoustic tiles
K 8	knowledge of types of wall/ceiling systems
K 9	knowledge of manufacturers' specifications
K 10	knowledge of cutting methods for gypsum board
K 11	knowledge of solid wood finishes
K 12	knowledge of requirements of other trades
K 13	knowledge of types of suspended ceilings
K 14	knowledge of fire rating of types of suspended ceilings
K 15	knowledge of bulkheads
K 16	knowledge of types of demountable wall systems such as curtain walls and office partitions
K 17	knowledge of speciality tools such as rotor zip, rasp, notched trowel and laminate roller
K 18	knowledge of methods to scribe and fit panels and tiles
K 19	knowledge of adhesive and fasteners such as contact cement, mastic and tile staple
K 20	knowledge of safe work practices such as dust control and respiratory protection
K 21	knowledge of taping and filling applications and requirements

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Sub-task

E-15.01 Installs gypsum board.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-15.01.01	prepare wall or ceiling surface to receive gypsum board
E-15.01.02	cut gypsum board to fit wall/ceiling
E-15.01.03	place gypsum board using equipment such as lifter, deadman and stepstool
E-15.01.04	secure gypsum board using fasteners such as gypsum screws, adhesives and ring nails
E-15.01.05	cut openings for electrical, plumbing, windows and HVAC

Sub-task

E-15.02 Installs panels and tiles.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-15.02.01	prepare wall or ceiling surface to receive panels and tiles
E-15.02.02	cut panels and tiles to fit wall/ceiling
E-15.02.03	place panels and tiles using tools such as laminate roller, trimmer and notched trowel
E-15.02.04	secure panels and tiles using fasteners such as adhesives and staples
E-15.02.05	cut openings in panels and tiles
E-15.02.06	plumb, scribe and cut panels to fit irregular corners

Sub-task

E-15.03 Installs solid wood finishes.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-15.03.01	prepare wall or ceiling surface to receive solid wood finishes
E-15.03.02	cut solid wood finishes to fit wall/ceiling
E-15.03.03	secure solid wood finishes using fasteners such as finish nails, brad nails and adhesives
E-15.03.04	cut wood to allow for penetrations such as electrical outlets, plumbing pipes and heating ducts
E-15.03.05	plumb, scribe and cut wood finishes to fit irregular corners

Sub-task

E-15.04 Installs suspended ceilings.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-15.04.01	cut suspended ceiling components such as wall channels, main tees and cross tees
E-15.04.02	secure suspended ceiling components such as eyelets, support drops, tee tracks and hangers
E-15.04.03	align and level grid to ensure uniformity
E-15.04.04	cut openings in panels to accommodate fixtures such as electrical, sprinkler and HVAC
E-15.04.05	cut and place tiles to fit

Sub-task

E-15.05 Installs demountable wall systems.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-15.05.01	place demountable wall system according to manufacturers' specifications
E-15.05.02	adjust demountable wall system for alignment
E-15.05.03	install clips on panels according to manufacturers' specifications
E-15.05.04	attach panels to wall framing

Task 16 Installs flooring.

Related Components (including, but not limited to)

Tiles, hardwood flooring, access flooring, laminate flooring, adhesives, screws, nails, trims, underlayment.

Required Knowledge

K 1	knowledge of types of underlayment such as plywood sheathing, cement board and isolation membrane
K 2	knowledge of types of floor finishes to be applied on underlayment
K 3	knowledge of fastening devices
K 4	knowledge of types of floor coverings such as tile, hardwood and laminate
K 5	knowledge of effects of expansion and contraction
K 6	knowledge of types of access flooring
K 7	knowledge of access flooring components
K 8	knowledge of sequence of installation
K 9	knowledge of requirements of other trades
K 10	knowledge of specialty floors such as gymnasium and bowling alley floors

Sub-task

E-16.01 Installs underlayment.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-16.01.01	select type and size of underlayment sheets such as hardboard and plywood
E-16.01.02	select type of fasteners and adhesive according to thickness and type of underlayment
E-16.01.03	place and secure underlayment over sub-surface according to code and manufacturers' specifications

Sub-task

E-16.02 Installs floor coverings.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-16.02.01	prepare floor surface to accept coverings
E-16.02.02	select floor covering to ensure quality and uniformity
E-16.02.03	select type of fasteners and adhesive according to manufacturers' specifications
E-16.02.04	acclimatize flooring prior to installation to allow for moisture absorption
E-16.02.05	cut floor covering to fit allowing for floor expansion and contraction
E-16.02.06	installs floor trim and accessories such as transition strips, expansion joints and stops
E-16.02.07	secure floor covering according to manufacturers' specifications
E-16.02.08	stagger joints to provide strength and aesthetics
E-16.02.09	place strip flooring using fasteners and adhesives

Sub-task

E-16.03 Installs access flooring.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-16.03.01	assemble access flooring according to manufacturers' specifications and drawings
E-16.03.02	use specified fasteners and adhesive such as concrete anchors and clips
E-16.03.03	cut and fit materials and components
E-16.03.04	level access flooring
E-16.03.05	install access flooring according to manufacturers' specifications and drawings

Task 17 — Installs interior doors and windows.

Related Components (including, but not limited to)

Tambour doors, sliding doors, swinging doors, pocket doors, bi-fold doors, accordion doors, fixed windows, operating windows, hinges, closers, locksets, thresholds, emergency exit devices, protection plates, door stops, kick plate, astragal, barrier free devices, dead bolts, fire rated doors, escutcheon, mullions, sashes, transom.

Required Knowledge

K 1	knowledge of types of interior window and door jambs/frames and their application
K 2	knowledge of installation procedures
K 3	knowledge of types of interior doors such as fire, hollow and louvered doors
K 4	knowledge of interior door components and their application
K 5	knowledge of glazing systems
K 6	knowledge of types of interior windows and their application
K 7	knowledge of interior window components
K 8	knowledge of types and styles of interior door and window hardware
K 9	knowledge of door and window schedule
K 10	knowledge of code requirements
K 11	knowledge of specialty interior doors such as rolling shutter, bi-fold partition and accordion

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Sub-task

E-17.01 Installs interior jambs/frames.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-17.01.01	verify rough opening to ensure fit
E-17.01.02	install blocking and backing before securing jambs and frames
E-17.01.03	level head jamb and plumb side jamb
E-17.01.04	align adjacent jambs or frames with each other
E-17.01.05	secure jambs/frames by shimming and fastening

E-17.01.06	insulate cavity around jambs/frames to create and acoustic break or fire stop
E-17.01.07	assemble steel and wood door frames prior to installation

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Sub-task

E-17.02 Installs interior doors.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-17.02.01	determine door size, swing and location according to schedule
E-17.02.02	lay out door slab and jamb for hinge location
E-17.02.03	mortise hinge gains on slab and jambs
E-17.02.04	hang door level and plumb with shims
E-17.02.05	secure door and jamb using fasteners

Sub-task

E-17.03 Installs interior windows.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-17.03.01	verify rough opening to ensure fit and adjust if necessary
E-17.03.02	select window according to schedule
E-17.03.03	place window in rough opening using shims and fasteners to level and plumb
E-17.03.04	secure window using fasteners

Sub-task

E-17.04 Installs interior door and window hardware.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-17.04.01	select hardware such as locks, closers and emergency devices according to schedule
E-17.04.02	position hardware using equipment such as templates and mortising jigs
E-17.04.03	install hardware to doors and windows according to schedules
E-17.04.04	adjust hardware to ensure smooth operation

Task 18 Constructs and installs stairs.

Related Components (including, but not limited to) Risers, treads, stringers, wedges, balustrades, skirt boards, newel post, half-newel post.

Required Knowledge

K 1	knowledge of types of stairs
K 2	knowledge of marking techniques
K 3	knowledge of stair geometry
K 4	knowledge of stair components such as glue blocks, wedges and handrails
K 5	knowledge of building code requirements
K 6	knowledge of types of geometric stairs such as winders, spiral and circular
K 7	knowledge of type of stringers such as open, housed and laminated

Sub-task

E-18.01 Constructs straight stairs.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-18.01.01	check stairwell dimensions such as openings, total rise and allowable headroom
E-18.01.02	select stock to ensure quality and uniformity
E-18.01.03	install stringers to give support and structure
E-18.01.04	install skirt board and risers
E-18.01.05	install finished treads
E-18.01.06	set the stair unit in place by shimming and levelling
E-18.01.07	secure stair unit using fasteners such as lag bolts, screws and adhesives
E-18.01.08	make adjustments for conditions such as flooring

Sub-task

E-18.02 Constructs geometric stairs.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-18.02.01	cut treads for geometric stairs
E-18.02.02	select stock to ensure quality and uniformity
E-18.02.03	install stringers to give support and structure
E-18.02.04	install skirt board and risers
E-18.02.05	install finished treads
E-18.02.06	check stairwell dimensions such as opening, total rise and allowable headroom
E-18.02.07	set the stair unit in place by shimming and levelling
E-18.02.08	secure stair unit using fasteners such as lag bolts, screws and adhesives
E-18.02.09	make adjustments for conditions such as flooring

Task 19 Constructs finish components.

Related Components (including, but not limited to)

Casing (door and windows), chair rails, shelving, washroom accessories, putty, wood plugs, hinges, mantles, slides, pulls, closers, casework, trim, laminates, biscuits, dowels, adhesives, draw bolts, anchors, valance, washroom partitions, cabinets, counter tops, display cases, grab bars, closet rods, mirrors, blinds, hand rails.

Required Knowledge

K 1	knowledge of boring techniques
K 2	knowledge of abrasives and adhesives
K 3	knowledge of wood finish requirements such as paint, stain or clear
K 4	knowledge of types of components/accessories such as casing, baseboards and crown moulding
K 5	knowledge of fasteners and anchors
K 6	knowledge of speciality tools such as plug cutter, biscuit joiner and mortise joiner
K 7	knowledge of types of joinery such as coped, mitre and butt joint
K 8	knowledge of constructing and using jigs

Sub-task

E-19.01 Fabricates finish components.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-19.01.01	perform required stair calculations
E-19.01.02	select stock for quality and uniformity
E-19.01.03	build components using manufacturers' specifications
E-19.01.04	construct built-in units such as cabinets, shelves, mantels and counter tops
E-19.01.05	construct special trims such as jamb extensions, window sills and aprons
E-19.01.06	construct jigs for repetitive fabrication

Sub-task

E-19.02 Installs finish components/accessories.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

E-19.02.01	select components to be installed according to specifications and work plan
E-19.02.02	secure finish components level, plumb and aligned
E-19.02.03	attach trims such as casing, baseboards and crown mouldings
E-19.02.04	secure speciality items such as towel bars, shower rods and mirrors
E-19.02.05	secure components according to barrier-free specifications
E-19.02.06	attach built-in components such as cabinet, shelves, mantels and counter tops
E-19.02.07	secure hand rails such as hallway rail and window rail according to code
E-19.02.08	install balustrade components such as newels, balusters and hand rail

BLOCK F — RENOVATIONS

Context

This block lists carpenter tasks that are unique to the renovation of residential and commercial buildings. Prior to any renovation it is important to assess the existing condition of the structure. Support activities that are performed prior to the actual renovation include removing existing material and protecting the structure. Renovation-specific construction tasks include joining additions to the existing structure and changing the existing structure during the renovation. During renovation it is critical that good communication be maintained with the client, owner and other trades.

Trends

The ability to reduce, reuse and recycle materials from a renovation project is growing in importance. There is an increase in the use of more efficient types of materials such as foamed plastics for insulating.

Tools and Equipment

Hand tools, portable power tools, stationary power tools, powder-actuated tools, pneumatic tools and equipment, rigging and hoisting equipment, layout instruments, personal protective equipment (PPE) and safety equipment.

Task 20 — Performs renovation-specific support activities.

Related Components (including, but not limited to)

Hoarding, shoring, underpinning, foundations, interior walls and floors, exterior walls and roofs, exterior wall and roof finishes, windows and doors.

Required Knowledge

K 1	knowledge of appearance and effects of conditions such as rot, mold/mildew and moisture
K 2	knowledge of removal and disposal methods of materials such as insulation, concrete, wood and shingles
K 3	knowledge of tarps, hoardings and separations
K 4	knowledge of framing systems such as balloon, platform, advanced framing, and post and beam
K 5	knowledge of outdated interior and exterior finishing systems such as lath and plaster, aluminium siding and stone dash stucco

K 6	knowledge of climate protection techniques such as hoarding and heating
K 7	knowledge of beam supports such as steel and wood
K 8	knowledge of load bearing wall requirements
K 9	knowledge of methods of containment and abatement of carcinogenic materials such as asbestos and PCBs by a certified contractor
K 10	knowledge of methods of identifying and correcting improper existing structure
K 11	knowledge of methods of temporary shoring used when structure is being compromised
K 12	knowledge of material removal methods that prevent damage to adjacent structure and/or components

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Sub-task

F-20.01 **Removes existing material.**

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

F-20.01.01	recognize materials that require removal due to conditions such as rot, damage and undersized materials
F-20.01.02	identify structures such as doors and windows, exterior walls and concrete foundations that need to be removed according to construction drawings
F-20.01.03	remove structures such as roofs, grade beams and walls according to construction drawings
F-20.01.04	cut out wooden materials such as lintels, floor joists and wall studs using tools and equipment such as reciprocating saws and hammers
F-20.01.05	remove concrete components such as footings and grade beams
F-20.01.06	remove exterior finishes such as siding, shingles and flashing to allow for installation of new material
F-20.01.07	remove structural components while insuring integrity and safety of remaining structure
F-20.01.08	remove or have removed materials that no longer meet code requirements or are a safety hazard, such as asbestos
F-20.01.09	remove existing materials with care to allow for re-installation of the same material

F-20.01.10	reclaim material so that it may be used elsewhere in the future
F-20.01.11	dispose of removed materials such as wood, concrete, insulation and glass

Sub-task

F-20.02 Protects structure during renovations.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

F-20.02.01	identify temporary support required during renovations according to construction drawings, codes, and as needed during construction
F-20.02.02	identify location of temporary support according to load being supported and base of support posts
F-20.02.03	construct and secure temporary beams and posts to meet code requirements and to avoid accidental collapse
F-20.02.04	provide protection to surfaces such as finished floors and ceilings that come into contact with supports, debris and foot traffic
F-20.02.05	use tarps and hoardings materials to cover openings into occupied living space and exposed building structures
F-20.02.06	cover exposed materials such as insulation, flooring, and wall and ceiling finishes to protect them from conditions such as sunlight and inclement weather

Task 21 Performs renovation-specific construction activities.

Related Components (including, but not limited to) Walls and wall coverings (interior and exterior), roofs and roof coverings, flashing, windows, doors, ceiling coverings, concrete structures, building membranes, insulation, venting.

Required Knowledge

K 1	knowledge of building exterior finishes such as stucco, aluminium siding, composite materials and metal roofing
K 2	knowledge of building interior finishes such as panelling, and lath and plaster
K 3	knowledge of energy efficient retrofit techniques

K 4	knowledge of components that can be repaired rather than replaced
K 5	knowledge of material installation methods that prevent damage to existing structure and components
K 6	knowledge of 'tie-in' methods to accommodate conditions such as structure not plumb, level, or square

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Sub-task

F-21.01 Joins new construction to old.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

F-21.01.01	select materials that are compatible with existing materials and that meet current standards
F-21.01.02	install exterior components such as flashing and sheathing to make a weatherproof transition from new construction to old
F-21.01.03	take steps to ensure a continuous building envelope is maintained such as joining new windows and doors to existing vapour and air barriers
F-21.01.04	attach new concrete walls and floors using approved fasteners
F-21.01.05	install new materials using methods that prevent damage to adjacent structure and/or components of structure
F-21.01.06	blend new material to existing material such as concrete and tile flooring, and siding
F-21.01.07	ensure a good bond from new material to old materials such as concrete, thinset mortar, and stucco

Sub-task

F-21.02 Changes existing structure during renovations.

NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
yes	yes	yes	yes	NV	yes	yes	yes	yes	yes	NV	NV	NV

Key Competencies

F-21.02.01	change existing rough openings such as stairwells, exterior and interior doors and windows to accommodate new components
F-21.02.02	change existing wall structures to increase energy efficiency by methods such as enlarging the wall cavity and adding additional insulation
F-21.02.03	relocate components such as stairs and shelving
F-21.02.04	determine the effect of removing an existing component such as interior walls, beams and floor joists
F-21.02.05	perform structural adjustments to supports such as teleposts and wood posts without causing damage to adjacent finishes
F-21.02.06	determine structural consequences of moving/deleting an existing structure such as stairs or part of a bearing wall
F-21.02.07	build new structures that compensate for changes in order to meet the design criteria

APPENDICES

APPENDIX A TOOLS AND EQUIPMENT

Hand Tools

adjustable wrench
aviation snips
bars (pry, wrecking, aligning)
brad driver
broom
brushes
bull float
butt gauge
carpenter's apron
caulking gun
chalk line
circle cutter
clamps
cold chisel
concrete edgers
cone/tie wrench
dry line
drywall t-square
file
finish trowel
framing square
hammers (framing, finishing, dead blow, rubber mallet, wood mallet, sledge, roofing, drywall)
hand float
hand level (24", 48", 6-ft., 8-ft., torpedo, line)
hand saws (hack, keyhole, drywall, coping, rip, hole, cross cut, back, pruning)
hatchet
knives (utility, drywall)
measuring tape (various)
multi-driver screwdriver
nail puller
nail set
pencil/marking instrument
pipe wrench
planes (various)
pliers and side cutter
plumb bob
rakes
rasp
rollers
scrapers (cabinet, floor, form)
screwdrivers (Robertson, Phillips, straight, Torx, hexagonal)
shovels
siding shears
slide hammer
sliding t-bevel
spud wrench
stapler (hammer, hand, electric)
string lines
tarps
tile cutter
tin snips
trowels
wall jack
wheelbarrow
wood chisels
wrecking bar

Portable Power Tools and Accessories

biscuit joiner
calculator
chainsaw
circular saw
cordless drill
coring drill and bits
cut-off saw (metal)
cut-out tools
concrete bits
concrete cutting saw
concrete vibrators
construction heaters
drywall gun
electric chipping hammer

Portable Power Tools and Accessories (continued)

electric drill and bits
electric shears
extension cords
fan-forced heater
generator
grinders
hammer drill
hydraulic jacks
jackhammer
jigsaw
laminate trimmer
mini-grinder
mitre saw
planer
porta power
powder-actuated tools
power screed
reciprocating saw
router and bits
sanders (palm, belt, random, detail)
staplers
tiger torch
tile wet saw
wet/dry vacuum
wood boring bits
wood spade bit set

Stationary Power Tools

band saw
disk sander/drum sander
drill press
dust collection equipment
grinder
jointer
mortiser
power feeder
radial arm saw
router table
shaper
table saw
thickness planer
wood lathe

Pneumatic Tools and Equipment

air compressor
air dryers
drills
fittings
gauges
hoses
impact gun
nailers
sandblasters
shears
staplers
wrenches

Rigging, Hoisting and Access Equipment

block and tackle
cables
chokers
come-alongs
eyebolts
grip hoist (tirfors)
ladders
ladder hoist
ladder jacks
lifting beam
pinch bar
pulleys
ropes
skid ramps
slings
spreader bar
synthetic lifting straps
tag lines
turnbuckles
wire rope

Layout Instruments

builder's level
chalk line
combination square
dividers
dividers
drawing instruments
dry line
jigs
laser level
measuring tape
plumb bob
scale rulers
scriber
scribing compass
sliding T-bevel
speed square
stair gauges
templates
theodolite
total station
transit
tri-square

Personal Protective Equipment and Safety Equipment

cutting goggles
fall protection equipment
first aid kit
full body harness
gloves
hard hat
hearing protection
knee pads
lanyard
reflective vest
respiratory equipment, dust mask and respirators
roof jack
rope grab
safety boots
safety glasses and shields
safety lifeline
solar protection

APPENDIX B GLOSSARY

access flooring	a secondary raised floor system that bears on a primary floor, used to create a chase for routing electrical and computer wiring, ventilation ducts, etc.
acclimatization	to make or become used to new climates or new conditions
back framing	the secondary non-structural framing done after the structural framing is completed; includes such items as valances, drop ceilings, chases and boxing for utilities, attic access, backing, etc.
balustrade	railing consisting of a series of balusters connected at the top by a rail
batter boards	boards at each corner (at right angles) of an excavation and at grid lines, used to indicate the location and alignment of footing and foundation walls and columns
beam	a main horizontal structural member constructed of wood, steel or concrete used to support secondary vertical loads
caisson	water tight box or enclosure used for construction work below grade or water level
column	a vertical structural member that supports the weight of other members
embedded steel	steel components that are an integral part of concrete structures; this includes reinforcing steel, anchor bolts, angle iron and miscellaneous hardware
falsework	the structural supports and the necessary bracing required for the support of temporary loads during construction
flooring	material used in the construction of floors where the surface material is known as finish flooring, while the base material is called sub-flooring
footing	supporting element at the base or bottom of a foundation wall, pier or column used to distribute weight
formwork	temporary structures constructed to the shape of the finished structural member, to support freshly poured concrete
foundation	the lower part that rests on and extends into the ground, providing support for the structure above it
geometric stairs	stair systems that include elliptical, curved or spiral stairs

grout	a cementitious or epoxy-based mixture, installed in a plastic state, to fill structural (column base plates) and non-structural voids (tile joints)
header	a joist or rafter that is perpendicular to the trimmer joists or rafters, used to support and frame openings
insulated concrete forms (ICF)	a modular system for forming concrete walls made of insulating foam material (block, panel, plank systems) where the forms typically remain in place as part of the finished structure
insulating	the installation of various materials used to resist heat, sound and cold transmission through walls, floors, ceilings and foundations
jack (trimmer) stud	a framing member that supports the lintel (header) and is used to provide added strength and stiffness around framed openings
joist	one of a series of horizontal members used to support a floor, ceiling or roof
lintel	wood, stone or steel member placed across the top of a rough door or window opening; it supports the weight from above
load bearing wall	a wall that supports primary vertical loads
maintenance	activities required for the proper functioning of power tools such as inspecting, oiling, tensioning of chains or belts, adjusting, dusting air filters, etc.
pier	a foundation which distributes the weight of a column
ponding (wet curing)	a method of curing a concrete slab by flooding its surface with water
powder - actuated tool	device that drives fasteners by means of an explosive charge
rafter	one of a series of structural members of a roof designed to support roof loads
rain screen	cavity in an exterior wall constructed to prevent wind, rain, moisture from penetrating the exterior wall to prevent mildew, premature rotting, etc.; rain screens effectively "drain the rain"
rise	vertical measurement on stairs, ramps and roofs
run	horizontal measurement on stairs, ramps and roofs
siding	boards and panels used as an exterior wall covering

SIPS	structural insulated panel systems; insulating material sandwiched between two layers of oriented strand board (OSB) prefabricated in a factory
site layout	location of primary building components on the building site via construction drawing interpretation in relation to property lines
stud	one of a series of vertical structural members used as support in walls and partitions
subfloor	boards or sheet material laid on joists under a finished floor
temporary structure	any structure erected during construction that is removed upon completion of the project
tile	thin building material made of cement, plastic or other resilient material used as a finish for walls, floors, ceilings or roofs
trimmer	see jack stud
yoking	installation of ties or clamping devices around column forms or over the top of wall or footing forms to keep them from spreading because of pressure imposed by concrete placement

APPENDIX C ACRONYMS

CSA	Canadian Standards Association
FRP	Fibreglass Reinforced Panels
HVAC	Heating, Ventilation and Air Conditioning
ICF	Insulated Concrete Form
MSDS	Supplier Material Safety Data Sheet
OH&S	Occupational Health and Safety Guidelines
OSB	Oriented Strand Board
PPE	Personal Protective Equipment
SIPS	Structural Insulated Panel Systems
VDR	Vapour-Diffusion Retarders
WHMIS	Workplace Hazardous Materials Information System
WWM	Welded Wired Mesh
XPS	Extruded Polystyrene

APPENDIX D BLOCK AND TASK WEIGHTING

BLOCK A COMMON OCCUPATIONAL SKILLS

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	25	6	5	41	NV	15	20	35	15	20	NV	NV	NV	20%

Task 1 Uses tools and equipment.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	10	25	15	5	NV	20	20	20	25	20	NV	NV	NV	18%

Task 2 Uses building materials.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	15	25	20	5	NV	18	10	10	10	15	NV	NV	NV	14%

Task 3 Interprets documentation.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	20	20	20	10	NV	18	25	20	20	15	NV	NV	NV	19%

Task 4 Organizes work.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	15	5	15	5	NV	10	15	10	5	10	NV	NV	NV	10%

Task 5 Performs layout.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	25	15	20	70	NV	20	25	30	30	30	NV	NV	NV	29%

Task 6 Builds and uses temporary access structures.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	15	10	10	5	NV	14	5	10	10	10	NV	NV	NV	10%

BLOCK B CONCRETE

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	15	18	25	15	NV	23	20	20	25	20	NV	NV	NV	20%

Task 7 Constructs formwork.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	70	75	65	70	NV	75	70	70	85	70	NV	NV	NV	72%

Task 8 Installs concrete, cement-based and epoxy products.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	30	25	35	30	NV	25	30	30	15	30	NV	NV	NV	28%

BLOCK C FRAMING

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	25	25	25	16	NV	25	20	15	25	20	NV	NV	NV	22%

Task 9 Constructs floor systems.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	45	40	35	24	NV	30	30	35	20	15	NV	NV	NV	30%

Task 10 Constructs wall systems.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	25	40	30	30	NV	30	30	25	45	15	NV	NV	NV	30%

Task 11 Constructs roof and ceiling systems.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	30	20	35	46	NV	40	40	40	35	70	NV	NV	NV	40%

BLOCK D EXTERIOR FINISH

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	15	20	15	10	NV	16	15	10	8	20	NV	NV	NV	14%

Task 12 Installs exterior doors and windows.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	25	40	40	32	NV	45	50	40	30	30	NV	NV	NV	37%

Task 13 Installs roofing.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	45	20	35	34	NV	30	20	30	20	10	NV	NV	NV	27%

Task 14 Finishes exterior walls and cornices.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	30	40	25	34	NV	25	30	30	50	60	NV	NV	NV	36%

BLOCK E INTERIOR FINISH

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	15	18	15	11	NV	18	15	15	17	10	NV	NV	NV	15%

Task 15 Applies wall/ceiling finishes.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	20	15	15	22	NV	15	30	25	20	10	NV	NV	NV	19%

Task 16 Installs flooring.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	15	20	15	16	NV	10	15	10	10	10	NV	NV	NV	13%

Task 17 Installs interior doors and windows.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	15	20	25	17	NV	30	25	15	25	20	NV	NV	NV	21%

Task 18 Constructs and installs stairs.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	30	30	25	26	NV	30	15	20	15	40	NV	NV	NV	26%

Task 19 Constructs finish components.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	20	15	20	19	NV	15	15	30	30	20	NV	NV	NV	21%

BLOCK F RENOVATIONS

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	National Average
%	5	13	15	7	NV	3	10	5	10	10	NV	NV	NV	9%

Task 20 Performs renovation-specific support activities.

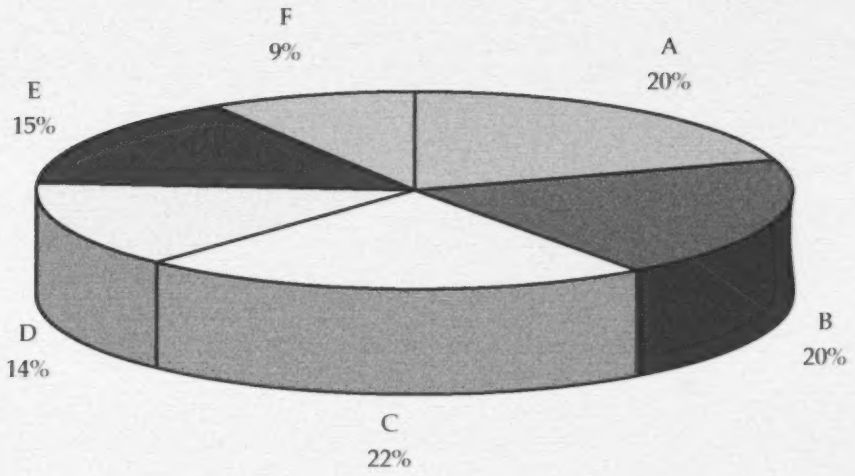
	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	50	40	50	47	NV	40	40	40	30	60	NV	NV	NV	44%

Task 21 Performs renovation-specific construction activities.

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU	
%	50	60	50	53	NV	60	60	60	70	40	NV	NV	NV	56%

APPENDIX E

PIE CHART*



TITLES OF BLOCKS

BLOCK A	Common Occupational Skills	BLOCK D	Exterior Finish
BLOCK B	Concrete	BLOCK E	Interior Finish
BLOCK C	Framing	BLOCK F	Renovations

*Average percentage of the total number of questions on an interprovincial examination, assigned to assess each block of the analysis, as derived from the collective input from workers within the occupation from all areas of Canada. Interprovincial examinations typically have from 100 to 150 multiple-choice questions.

APPENDIX F

TASK PROFILE CHART — CARPENTER

BLOCKS	TASKS	SUB-TASKS				
A - COMMON OCCUPATIONAL SKILLS	1. Uses tools and equipment.	1.01 Uses hand tools.	1.02 Uses portable power tools.	1.03 Uses stationary power tools.	1.04 Uses powder-actuated tools.	1.05 Uses pneumatic tools and equipment.
		1.06 Uses rigging and hoisting equipment.	1.07 Uses layout instruments.	1.08 Uses tack welding equipment. (NOT COMMON CORE)	1.09 Uses torch cutting equipment. (NOT COMMON CORE)	1.10 Uses personal protective equipment (PPE) and safety equipment.
	2. Uses building materials.	2.01 Selects materials.	2.02 Handles materials.	2.03 Installs fasteners, adhesives and connectors.	2.04 Installs membranes and sealants.	2.05 Installs foundation protection.
		2.06 Installs insulating materials.				
	3. Interprets documentation.	3.01 Interprets construction drawings.	3.02 Interprets specifications.	3.03 Applies building codes.	3.04 Interprets safety and workplace documentation.	
	4. Organizes work.	4.01 Estimates materials.	4.02 Communicates with others.	4.03 Schedules work sequence.	4.04 Maintains safe work environment.	4.05 Performs site preparation.
	5. Performs layout.	5.01 Performs site layout.	5.02 Lays out concrete formwork.	5.03 Lays out floor systems.	5.04 Lays out wall systems.	5.05 Lays out ceiling systems.

BLOCKS	TASKS	SUB-TASKS				
		5.06 Lays out roof systems.	5.07 Lays out stairs.			
	6. Builds and uses temporary access structures.	6.01 Uses ladders and temporary stairs and ramps.	6.02 Erects/ dismantles scaffolding.			
B - CONCRETE	7. Constructs formwork.	7.01 Erects excavation shoring and underpinning.	7.02 Erects concrete shoring.	7.03 Constructs footing forms.	7.04 Constructs wall and grade beam formwork.	7.05 Constructs slab-on-grade formwork.
		7.06 Constructs suspended slab formwork.	7.07 Constructs column formwork.	7.08 Constructs stair formwork.	7.09 Installs embedded steel.	7.10 Dismantles/ maintains formwork.
	8. Installs concrete, cement-based and epoxy products.	8.01 Places concrete.	8.02 Facilitates curing of concrete.	8.03 Performs basic concrete finishing.	8.04 Installs pre-cast components.	8.05 Installs grout.
C - FRAMING	9. Constructs floor systems.	9.01 Installs engineered floor systems.	9.02 Constructs dimensional lumber floor framing.			
	10. Constructs wall systems.	10.01 Installs engineered wall systems.	10.02 Constructs dimensional lumber wall framing.			
	11. Constructs roof and ceiling systems.	11.01 Installs engineered trusses.	11.02 Constructs roof and ceiling framing.			

BLOCKS	TASKS	SUB-TASKS				
D - EXTERIOR FINISH	12. Installs exterior doors and windows.	12.01 Installs exterior jambs/ frames.	12.02 Installs exterior doors.	12.03 Installs specialty exterior doors.	12.04 Installs exterior windows.	12.05 Installs exterior door and window hardware.
	13. Installs roofing.	13.01 Installs roofing components.	13.02 Installs roof coverings.			
	14. Finishes exterior walls and cornices.	14.01 Installs exterior wall trims.	14.02 Installs exterior wall coverings.			
E - INTERIOR FINISH	15. Applies wall/ ceiling finishes.	15.01 Installs gypsum board.	15.02 Installs panels and tiles.	15.03 Installs solid wood finishes.	15.04 Installs suspended ceilings.	15.05 Installs demountable wall systems.
	16. Installs flooring.	16.01 Installs underlayment.	16.02 Installs floor coverings.	16.03 Installs access flooring.		
	17. Installs interior doors and windows.	17.01 Installs interior jambs/ frames.	17.02 Installs interior doors.	17.03 Installs interior windows.	17.04 Installs interior door and window hardware.	
	18. Constructs and installs stairs.	18.01 Constructs straight stairs.	18.02 Constructs geometric stairs.			
	19. Constructs finish components.	19.01 Fabricates finish components.	19.02 Installs finish components/ accessories.			

BLOCKS	TASKS	SUB-TASKS	
F - RENOVATIONS	20. Performs renovation-specific support activities.	20.01 Removes existing material.	20.02 Protects structure during renovations.
	21. Performs renovation-specific construction activities.	21.01 Joins new construction to old.	21.02 Changes existing structure during renovations.